VINTAGE STUDY

1982

DEPARTMENT OF THE ARMY
INDUSTRIAL PLANT EQUIPMENT
(IPE)

US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS
61299

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This study is an analysis of Department of the Army Industrial Plant Equipment, active and inactive, based on year of manufacture. A comparison of active Government equipment with private industry is made based on three age groups: 0-9 years old, 10-19 years old, and 20 years or older. The equipment status within the US Army Materiel Development and Readiness Command (DARCOM) is presented for six classes of IPE for the major subordinate commands and laboratories and centers. The vintage (age distribution) and quantity and percent exceeding useful service life are portrayed for each class. The status

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SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

of numerical control (NC) equipment is presented showing the classes, quantity and use, and trends of the inventory.

VINTAGE STUDY

1982

Department of the Army

Industrial Plant Equipment

(IPE)

PREPARED BY

FRANK T. BOGDANOWICZ
Mechanical Engineer
US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
Rock Island Arsenal
Rock Island, Illinois 61299

PREFACE

This study was conducted in compliance with paragraph 1-11, AR 700-90. It is an analysis of Department of the Army industrial plant equipment, active and inactive, based on year of manufacture. A comparison of active Government equipment with private industry is made based on three age groups: 0-9 years old, 10-19 years old, and 20 years or older. The equipment status within the US Army Materiel Development and Readiness Command (DARCOM) is presented for six classes of IPE for the major subordinate commands and laboratories and centers. The vintage (age distribution) and quantity and percent exceeding useful service life are portrayed for each class. The status of numerical control (NC) equipment is presented showing the classes, quantity and use, and trends of the inventory.

VINTAGE STUDY

INDEX

FIGURES

INTRODUCTION

This study is an analysis of Department of the Army industrial plant equipment (IPE) based on year of manufacture. Six types of IPE are considered: metalcutting, welding, metalforming, heat treating and furnaces, electrical testing and measuring, and mechanical testing and measuring equipment. Illustrations of each type and the selected Federal Supply Classes (FSC) are contained in Appendix A. The age of the equipment is illustrated by sorting it into three age groups: 0 to 9 years old, 10 to 19 years old, and 20 years or over. On this basis, Government equipment is compared with private industry. This comparison provides a means to evaluate whether the acquisition of IPE within the Department of the Army is keeping pace with private industry. A comparison of equipment age with useful service life is also included.

The DIPEC SP-57 Report, dated 31 December 1981, The Central Inventory of IPE Report as of 31 December 1981, and the DIPEC SP-50 Report as of 30 January 1982 served as the source documents for Government equipment. Industry data was obtained from the Tenth, Eleventh, and Twelfth Inventories of Metalworking Equipment published in 1968, 1973, and 1978, respectively, by the American Machinist Magazine, a McGraw-Hill publication.

Equipment age is not necessarily the best or only criteria to determine usefulness or capability. Other factors such as use and maintenance strongly influence a machine's serviceability. However, equipment age does provide a convenient yardstick by which a comparison can be made.

It is reasonable to assume that production equipment used by private industry is subjected to essentially uninterrupted service, necessitating earlier replacement. On the other hand, much of the Government equipment is used intermittently. Generally, equipment of a more recent year of manufacture possesses improved operating characteristics, and it follows that the newer equipment possesses improved production capabilities. But, items of equipment with an older year of manufacture may perform very satisfactorily for a given, specific purpose.

This study is not concerned with all these detailed considerations, but concentrates on equipment age only.

SECTION I

DEPARTMENT OF THE ARMY

The Department of the Army (DA) inventory of industrial plant equipment (IPE) consists of 118,876 items with an acquisition cost of $1.693 billion.

Metalworking equipment, consisting of metalcutting and metalforming equipment, constitute the heart of an industrial facility and, as such, provides a good indication of productive capacity. The status of the Department of the Army inventory is shown in Figure I-1. The total inventory is characterized by small changes with a decreasing trend.

Annual inventory status changes for active and inactive equipment are shown in Figure I-2. The quantity of active equipment has been decreasing. Some, but not all, of this equipment has been retained in plant equipment packages, resulting in increases to inactive equipment. The noticeable increase of inactive equipment in 1978 was caused by the transfer of USN PEP's to the Army as part of the single manager for conventional ammunition.

The US Army Materiel Development and Readiness Command (DARCOM) controls 103,005 items, or 87 percent, of the Department of the Army (DA) inventory. As shown in Figure I-3, DARCOM is the major user of IPE within DA.

In view of this, it is clear that the items controlled by DARCOM can be considered representative of DA.

ACTIVE EQUIPMENT

Most of the equipment controlled by DARCOM, 76,795 items or 76 percent, is active. The quantity and percent of selected classes of this equipment exceeding useful service life is shown in Figure I-4.

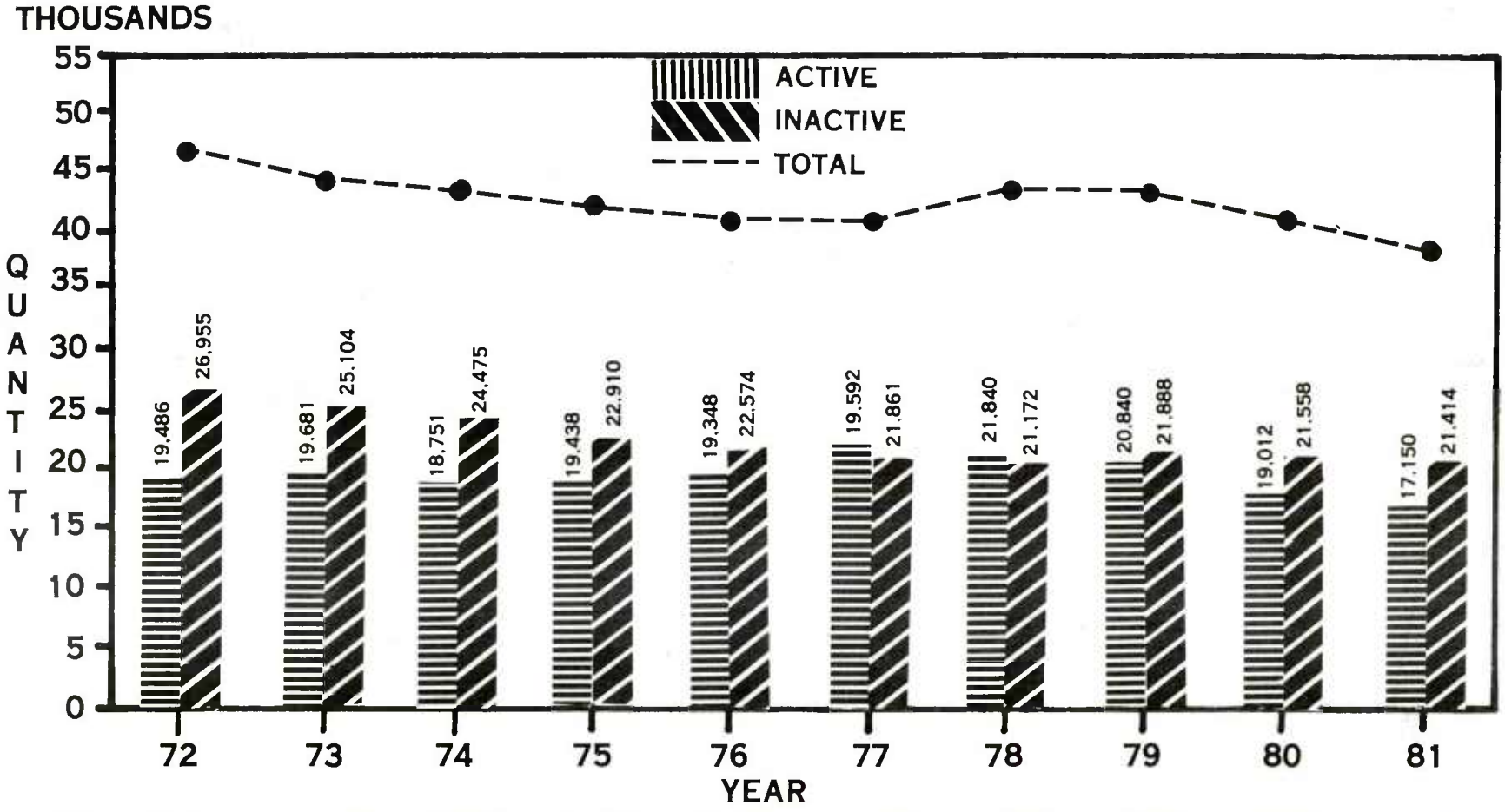
The quantity and percent exceeding useful service life continues to be unfavorable. It varies from 30 percent for welding equipment to 64 percent for metalforming equipment. In 1986, five years from now, these percentages will increase to 48 percent and 71 percent respectively. Metalcutting and metalforming equipment have the highest percent exceeding useful service life. This is significant because of the relatively higher cost of these items. However, electrical testing and measuring equipment with 11,049 items, is the class with the greatest number exceeding useful service life. Metalcutting equipment is a close second with 10,251 items and metalforming equipment is a distant third with 2,553 items.

The vintage (age distribution) of active equipment is shown in Figure I-5. Metalcutting equipment is the oldest with 11,433 items, or 70 percent, 20 or more years old. Welding equipment is the newest with 844 items, or 42 percent, less than ten years old.

INACTIVE EQUIPMENT

The vintage (age distribution) of DARCOM inactive equipment is shown in Figure I-6. As might be expected, the inactive equipment has an older age profile than does the active equipment. Metalcutting equipment has the highest number, 11,399 items, and the highest percent, 89 percent, in the 20 year and over age group. Percentage wise, metalforming equipment is a close second with 87 percent 20 years old or older, but far behind in quantity with only 2,893 items. Welding equipment has the most favorable age profile with 32 percent less than ten years old, but amounts to only 115 items.

INVENTORY OF METALWORKING EQUIPMENT
DEPARTMENT OF THE ARMY



	72	73	74	75	76	77	78	79	80	81
TOTAL	46,441	44,785	43,226	42,348	41,922	41,453	43,012	42,728	40,570	38,564

FIGURE I-1

INVENTORY STATUS CHANGES

DEPARTMENT OF THE ARMY METALWORKING EQUIPMENT

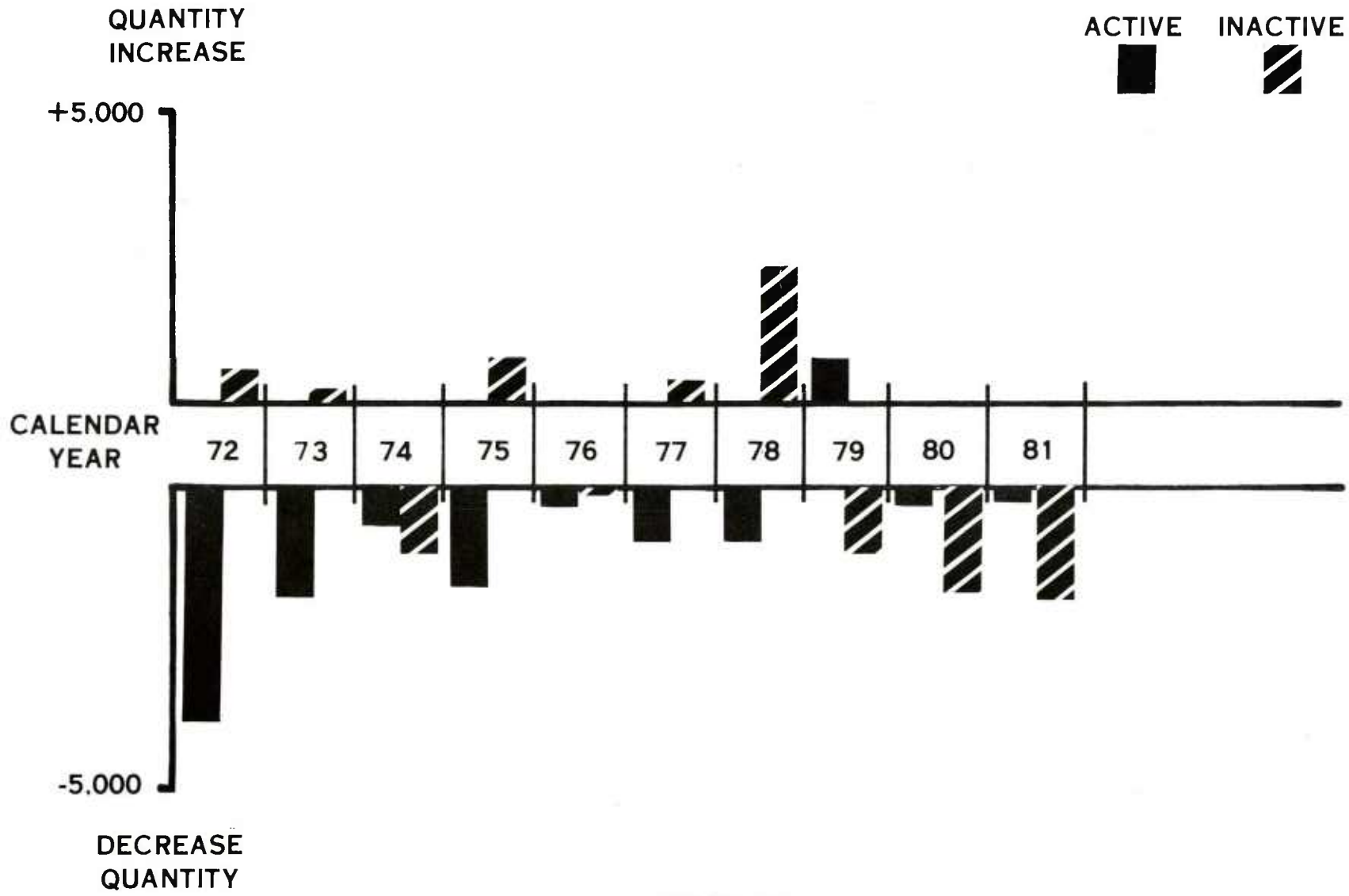
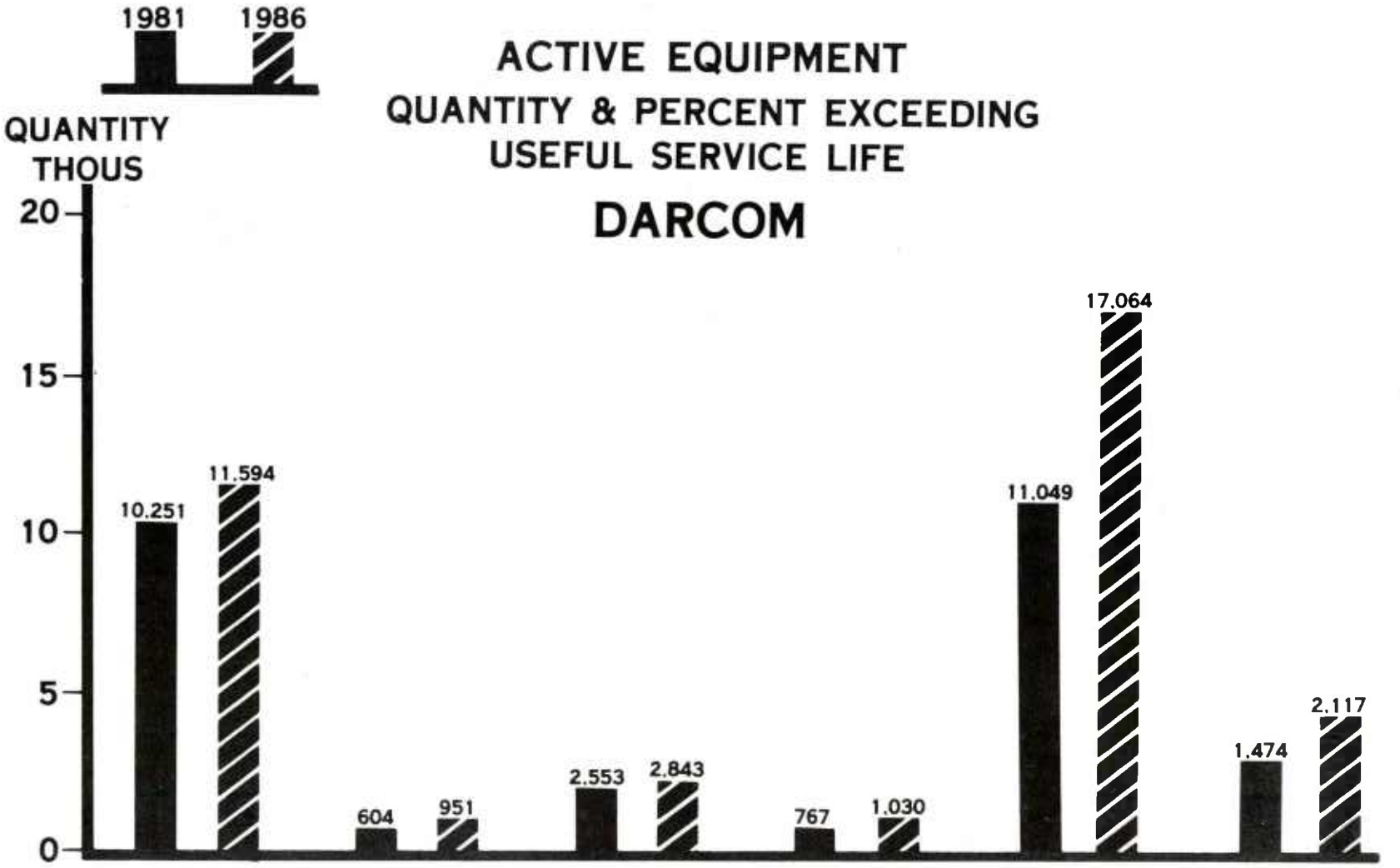


FIGURE I-2

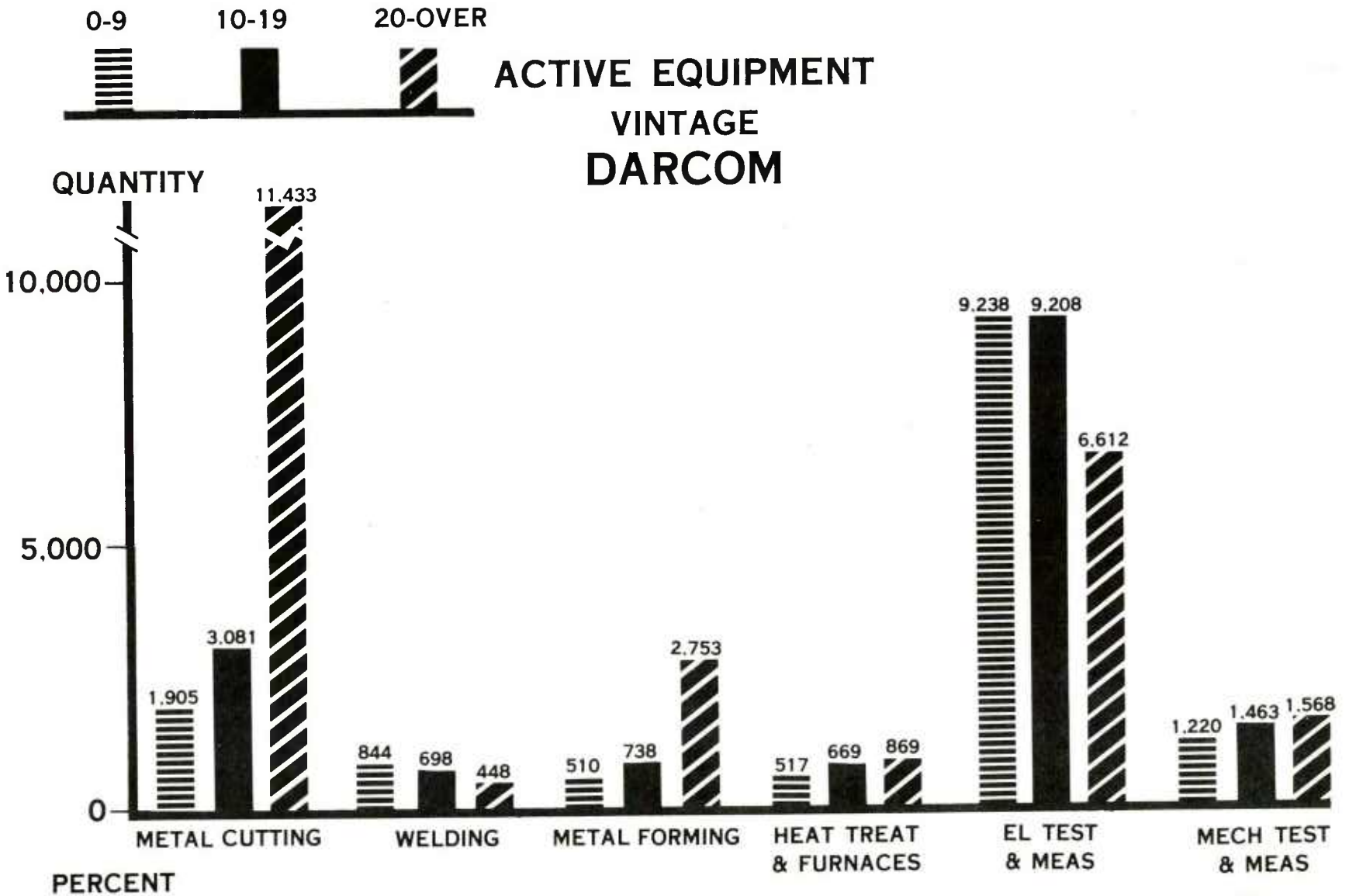
INDUSTRIAL PLANT EQUIPMENT

FIGURE I-3



PERCENT						
1981	62	30	64	37	44	35
1986	71	48	71	50	68	50

FIGURE 1-4



PERCENT						
0-9	11	42	13	25	37	29
10-19	19	35	18	33	37	34
20-OVER	70	23	69	42	26	37

FIGURE 1-5

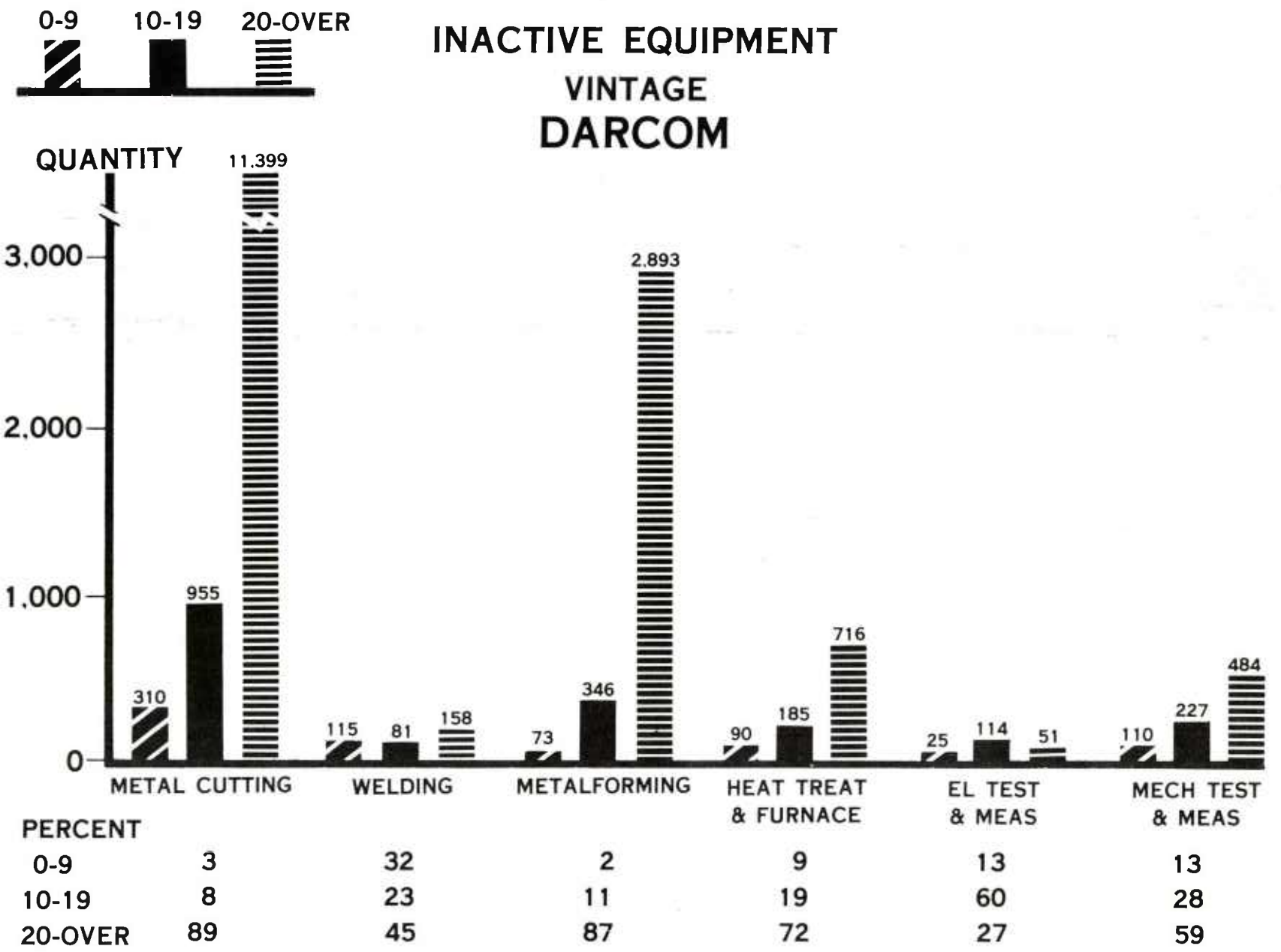

0-9
10-19
20-OVER
INACTIVE EQUIPMENT
VINTAGE
DARCOM
QUANTITY
3,000
2,000
1,000
0
11,399
2,893
955
346
716
484
310
115
81
158
73
90
185
25
114
51
110
227
METAL CUTTING
WELDING
METALFORMING
HEAT TREAT & FURNACE
EL TEST & MEAS
MECH TEST & MEAS
PERCENT
0-9 3 32 2 9 13 13
10-19 8 23 11 19 60 28
20-OVER 89 45 87 72 27 59

FIGURE 1-6

SECTION II

DARCOM vs. INDUSTRY

An age comparison of DARCOM and private industry equipment is shown in Figure II-1. The data for DARCOM was obtained from previous Vintage Studies. Private industry data was obtained from the Tenth, Eleventh, and Twelfth Inventories of Metalcutting Equipment published in 1968, 1973, and 1978, respectively, by the American Machinist Magazine, a McGraw-Hill publication.

METALCUTTING AND METALFORMING EQUIPMENT

The age profile of DARCOM equipment is strongly influenced by the significantly large portion of the inventory that was acquired during the period 1950 to 1954. As a result, the age of the metalcutting and metalforming inventory has shifted from the 10-19 year range in 1968 to the 20 year and over range in 1973 and 1978. This shift also reflects a replacement level that has not kept pace with the aging of the inventory.

Private industry, on the other hand, exhibits a relatively consistent investment in replacement of equipment. As a result, the equipment operated by private industry has a much better age profile than the equipment available to the Army. Private industry takes greater advantage of the improved operating characteristics and production capabilities of newer equipment.

WELDING/JOINING EQUIPMENT

Private industry and DARCOM equipment exhibit similar status in this classification. The shorter useful life which requires earlier replacement seems to be the major reason for this similarily.

CURRENT STATUS

A comparison of the current status of DARCOM equipment compared to private industry equipment is shown in Figure II-2. The age profile of DARCOM equipment continues to be inferior to that of private industry. A further deterioration of the age profile of DARCOM welding equipment worsens the comparison.

TRENDS

Private industry appears to have reduced their investment in equipment replacement over the years. A definite decrease in newer equipment, 0-9 years old, and an increase in older equipment, 20 years and older, is evident. In spite of this, the Army is still in an unfavorable position compared to private industry.

EQUIPMENT REPLACEMENT

The number of items less than ten years old and those 10 to 19 years old provide an indication of the equipment replacement during those time frames. In the last ten years, only 1,905 metalcutting items and 510 metalforming items were added to the inventory. During the previous ten years, 3,081 metalcutting items and 738 metalforming items were added to the inventory.

The number of items that would have to be replaced to make only DARCOM's newer equipment, 0-9 years old, comparable to private industry is large. It would require replacement of 3,185 metalcutting items and 650 metalforming items. From these figures it can be seen that the replacement rate for DARCOM is much too low.

Estimating the cost to purchase the equipment to cause the inventory of DARCOM metalcutting and metalforming equipment to approach that of private industry is difficult due to the extreme range of acquisition cost for this equipment. A review of the FY 81 projects revealed that the price range for items approved for acquisition ranged from $2,905 to $425,500. The average cost of all IPE as of 31 December 1981 was $15,758. Because of the wide range in the acquisition cost for industrial plant equipment, average acquisition cost is of limited value. Recognizing this, a very rough estimate of the cost to make the Army's inventory approach that of private industry is approximately $60,433,762.

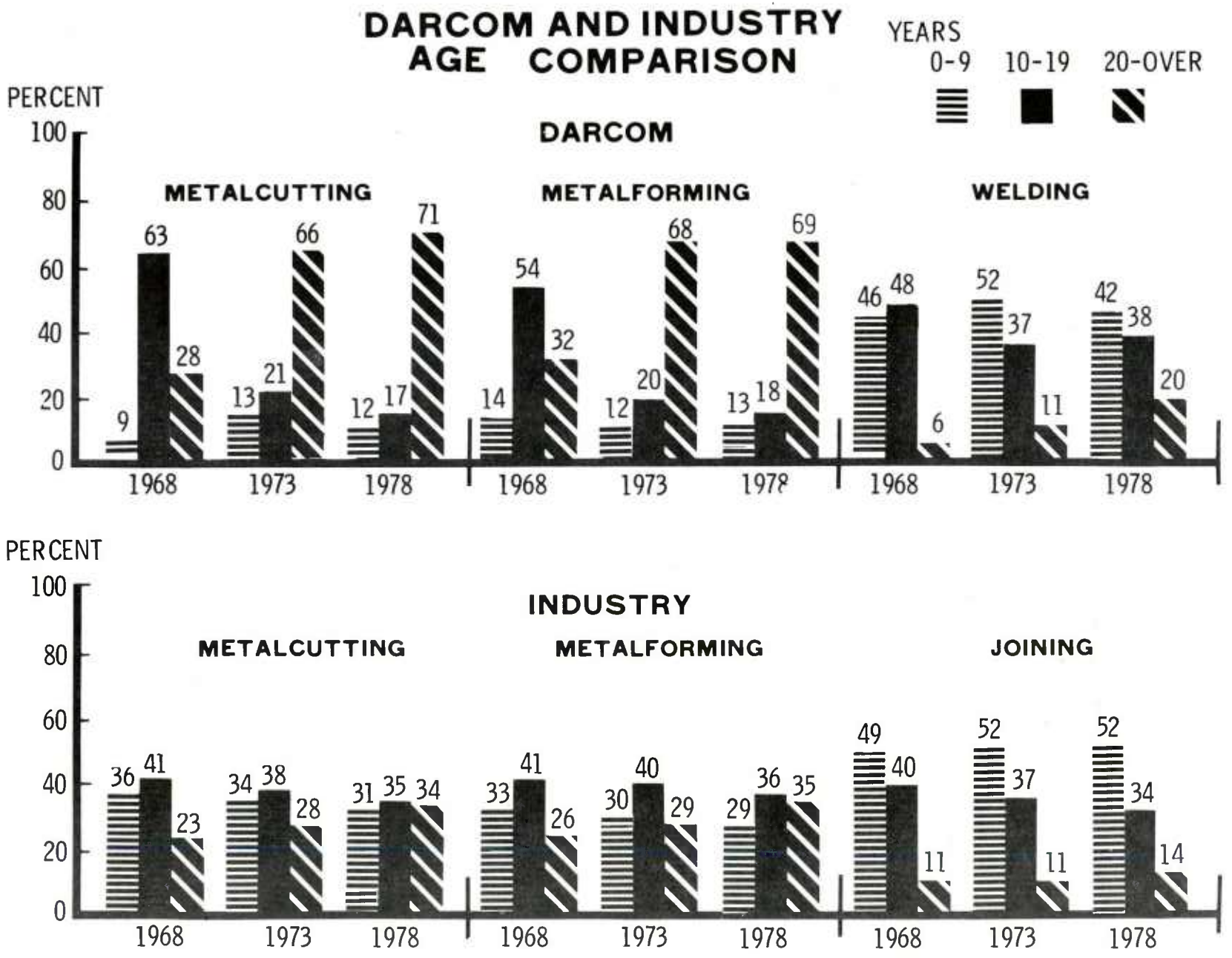

DARCOM AND INDUSTRY
AGE COMPARISON
YEARS
0-9
10-19
20-OVER
PERCENT
DARCOM
METALCUTTING
METALFORMING
WELDING
100
80
60
40
20
0
9
63
28
13
21
66
12
17
71
14
54
32
12
20
68
13
18
69
46
48
6
52
37
11
42
38
20
1968
1973
1978
PERCENT
INDUSTRY
METALCUTTING
METALFORMING
JOINING
36
41
23
34
38
28
31
35
34
33
41
26
30
40
29
29
36
35
49
40
11
52
37
11
52
34
14

FIGURE II-1

DARCOM AND INDUSTRY AGE COMPARISON

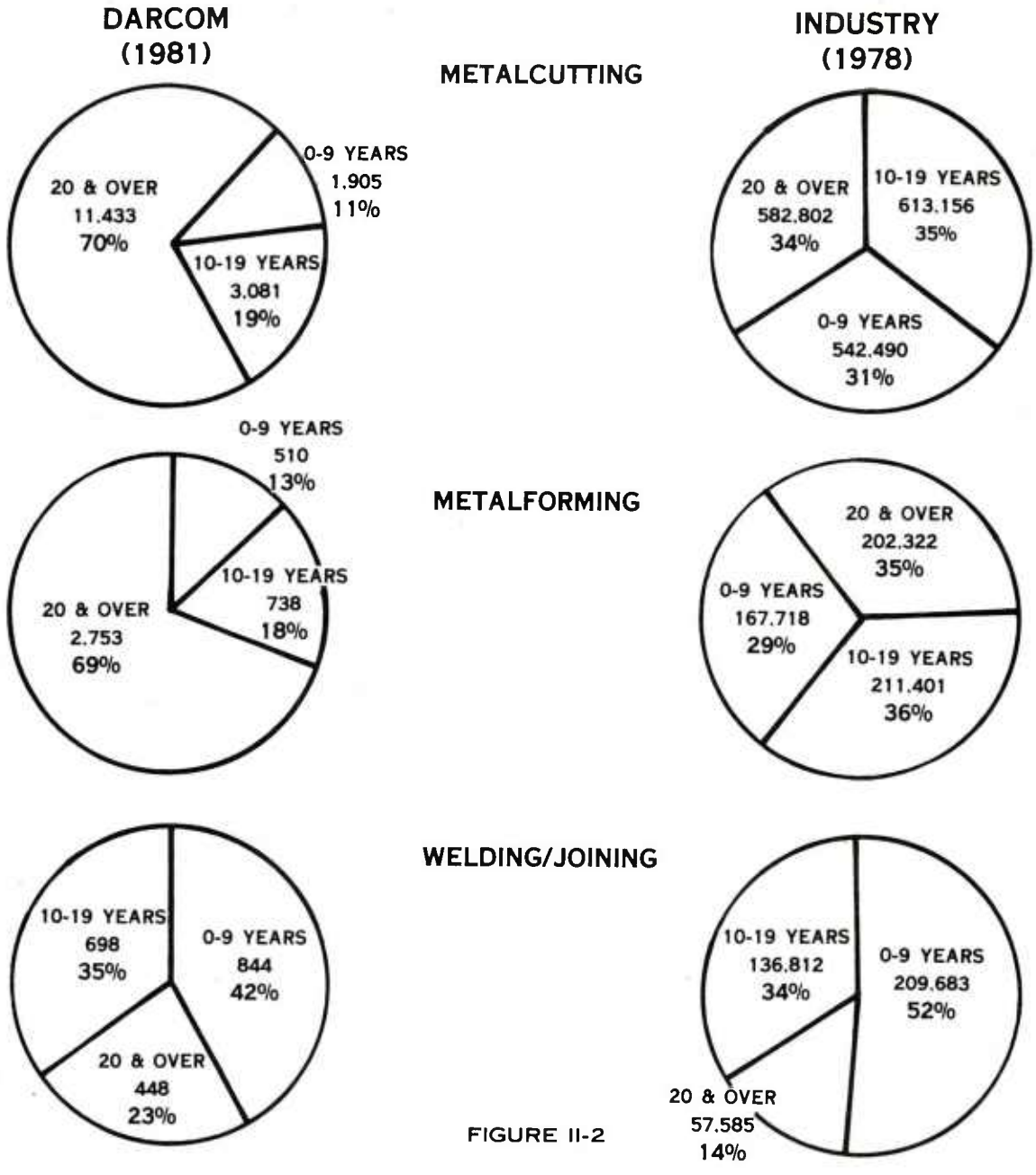


FIGURE II-2

SECTION III

EQUIPMENT STATUS WITHIN DARCOM

This section presents the status of each of the six classes of IPE for the major subordinate commands (SUBMACOM's) and laboratories and centers (LABS & CENTERS) within DARCOM. The age distribution (vintage) and the quantity and percent exceeding useful service life are portrayed for each class.

The service life data were calculated by DIPEC based on the useful service life contained in AR 700-43 for each type of equipment within each class. These detailed service life listings were averaged for each class to facilitate data assembly.

ACTIVE EQUIPMENT

Age Distribution (Vintage). The age distribution for each of the six classes of equipment is shown in the following figures:

The age distribution of active DARCOM equipment is influenced greatly by the class of the equipment.

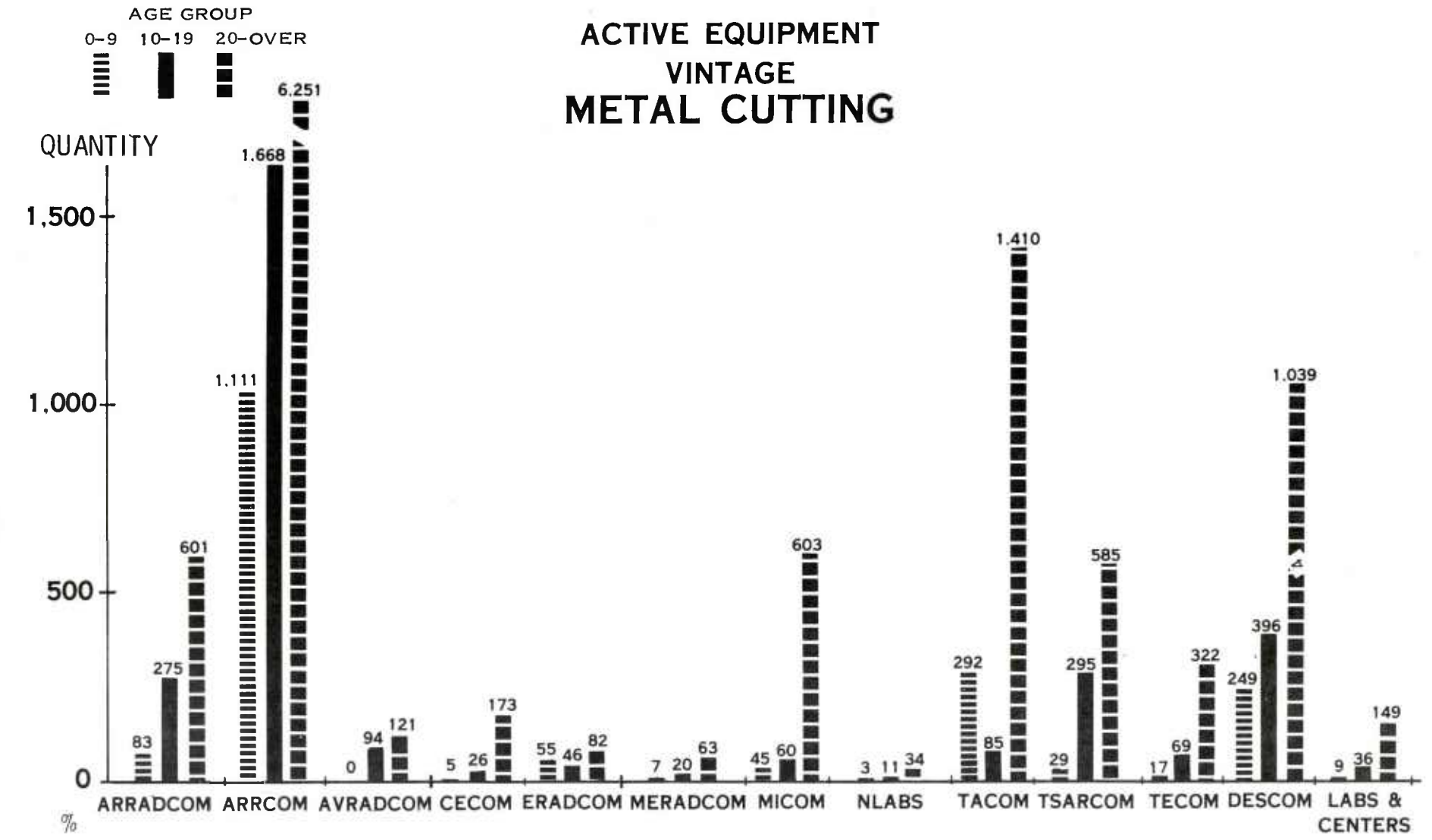
Metalcutting and metalforming equipment are the oldest, most of it over 20 years old. This is true regardless of which command owns it.

Welding equipment, because of its shorter life, is newer with most of the equipment less than 20 years old.

Heat treating equipment and furnaces are essentially evenly distributed with respect to age. AVRADCOM and TSARCOM are notable exceptions with much of their equipment over 20 years old.

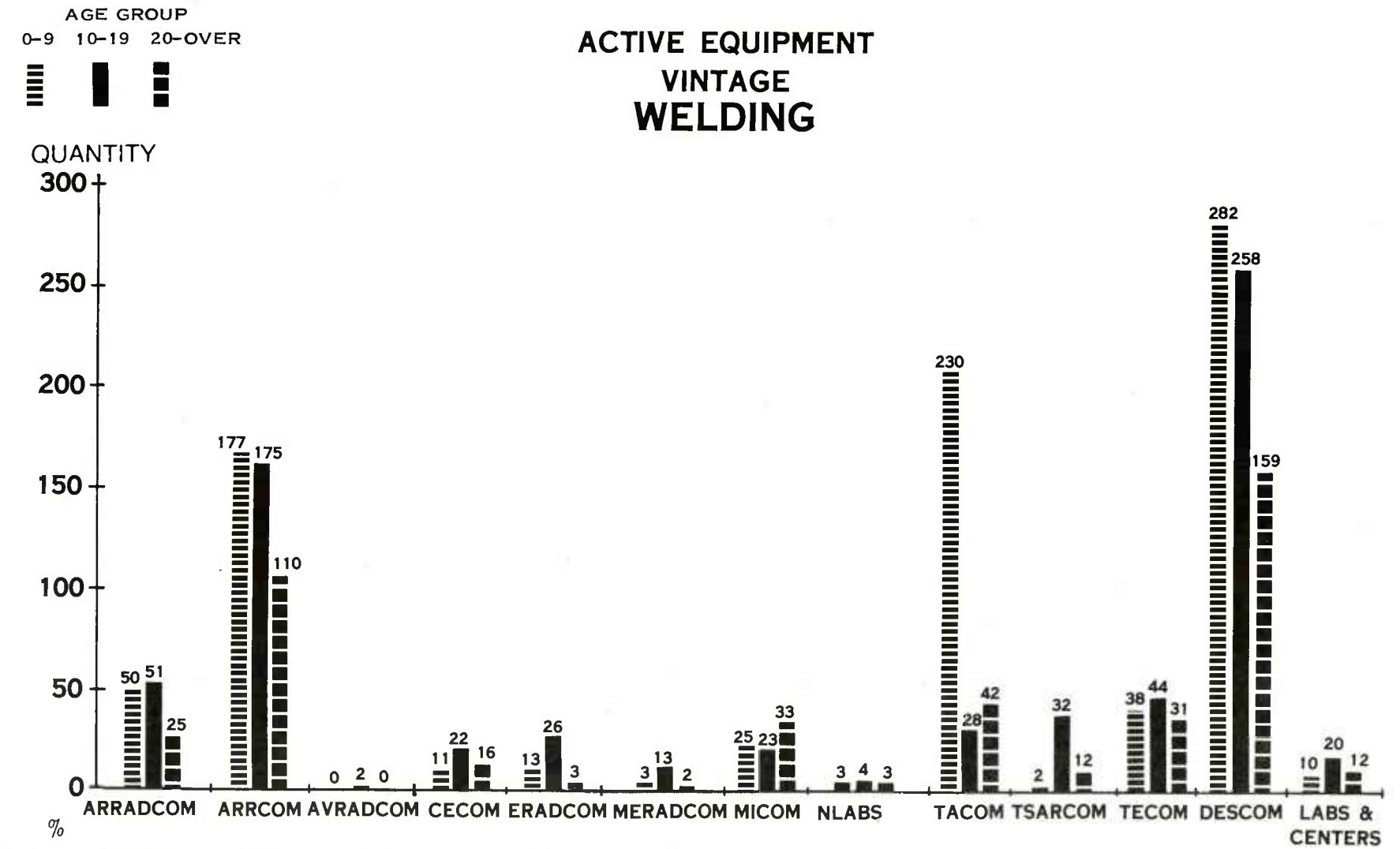
Electrical testing and measuring equipment is the newest within DARCOM with much of it less than 10 years old. It is used extensively by TECOM, MICOM, DESCOM, ARRADCOM, CECOM, and ERADCOM.

Mechanical testing and measuring equipment is generally less than 20 years old. ARRCOM, with 1,512 items, is by far the greatest user of this class of equipment.



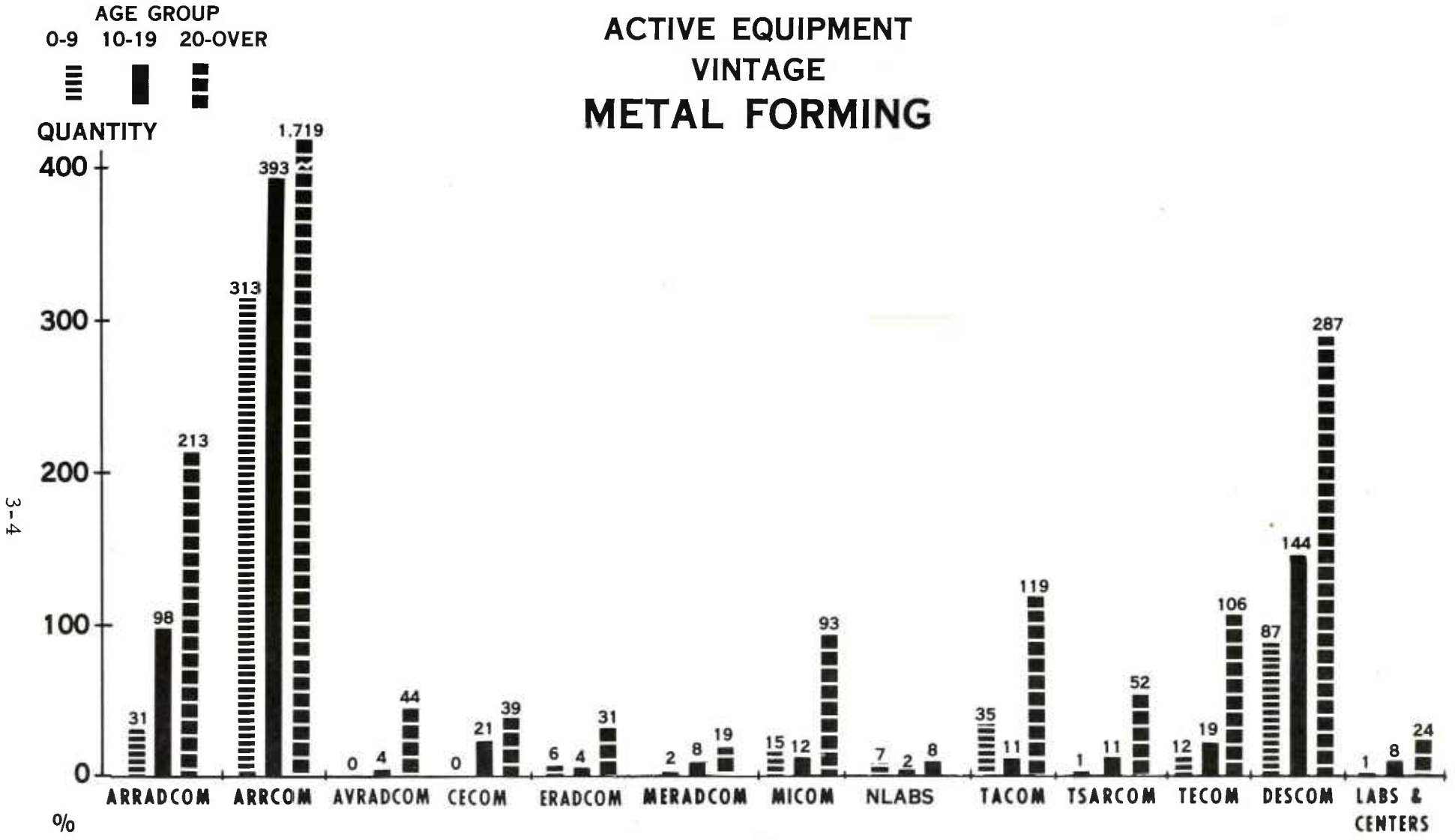
	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	8	12	0	2	30	8	6	6	16	3	4	15	5
10-19	29	19	44	13	25	22	9	23	5	33	17	23	18
20-OVER	63	69	56	85	45	70	85	71	79	64	79	62	77

FIGURE III-1



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YEARS	40	38	0	22	31	17	31	22	77	4	34	40	24
10-19	40	38	100	45	62	72	28	45	9	70	39	37	48
20-OVER	20	24	0	33	7	11	41	33	14	26	27	23	28

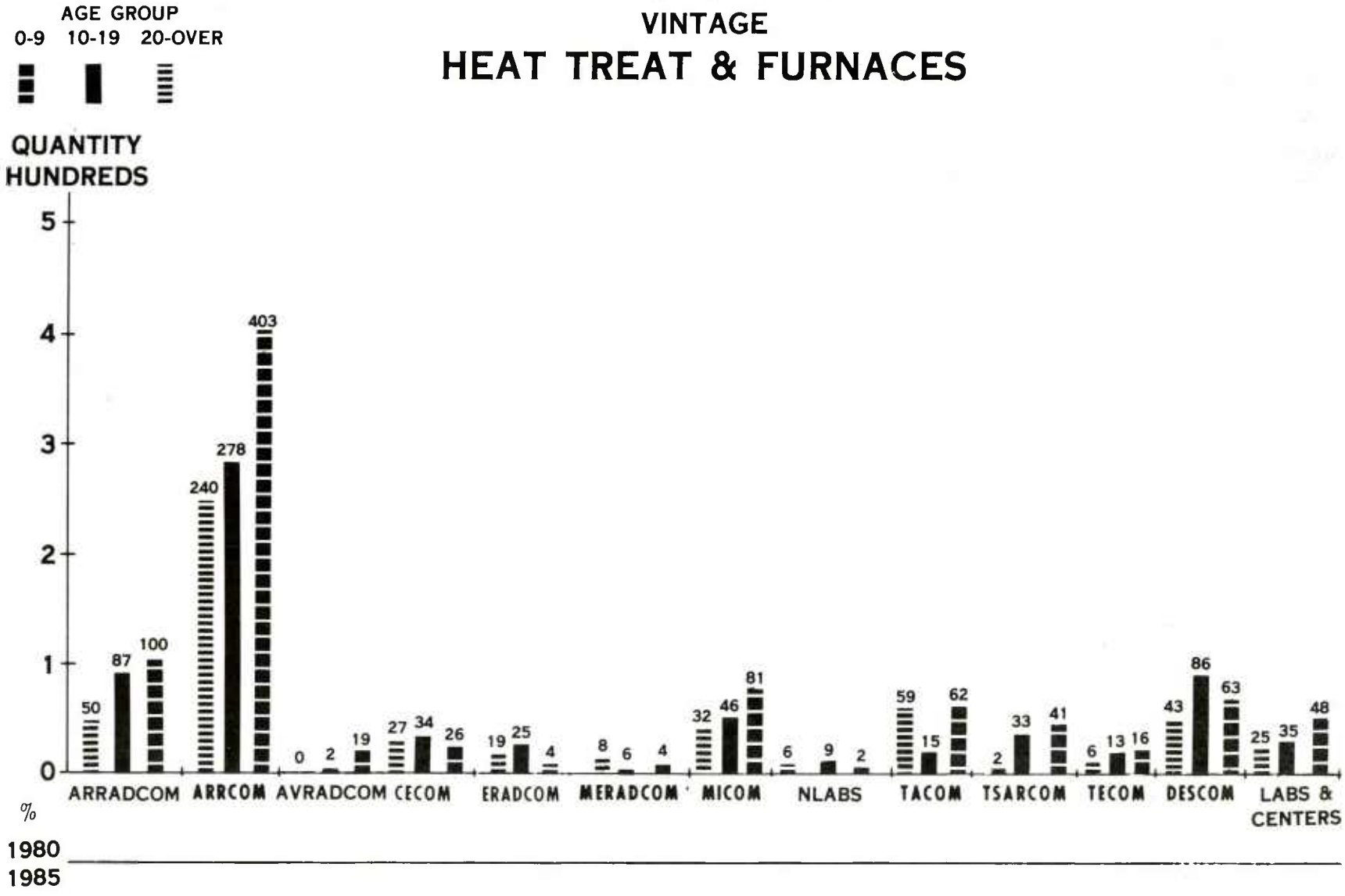
FIGURE III-2



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	9	13	0	0	15	7	12	41	21	2	9	16	3
10-19	29	16	8	35	10	28	10	12	7	17	14	29	24
20-OVER	62	71	92	65	75	65	78	47	72	81	77	55	73

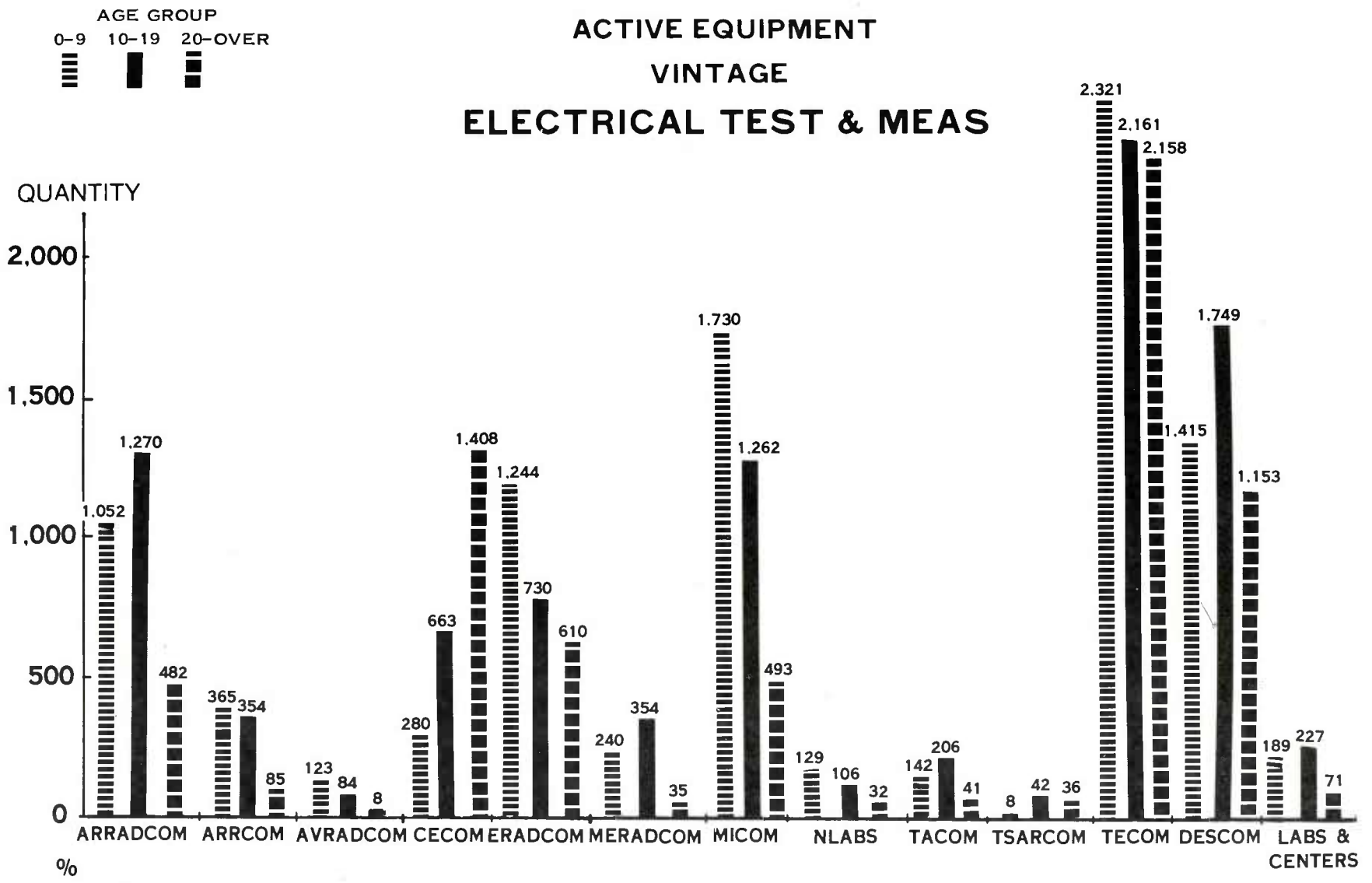
FIGURE III-3

ACTIVE EQUIPMENT
VINTAGE
HEAT TREAT & FURNACES



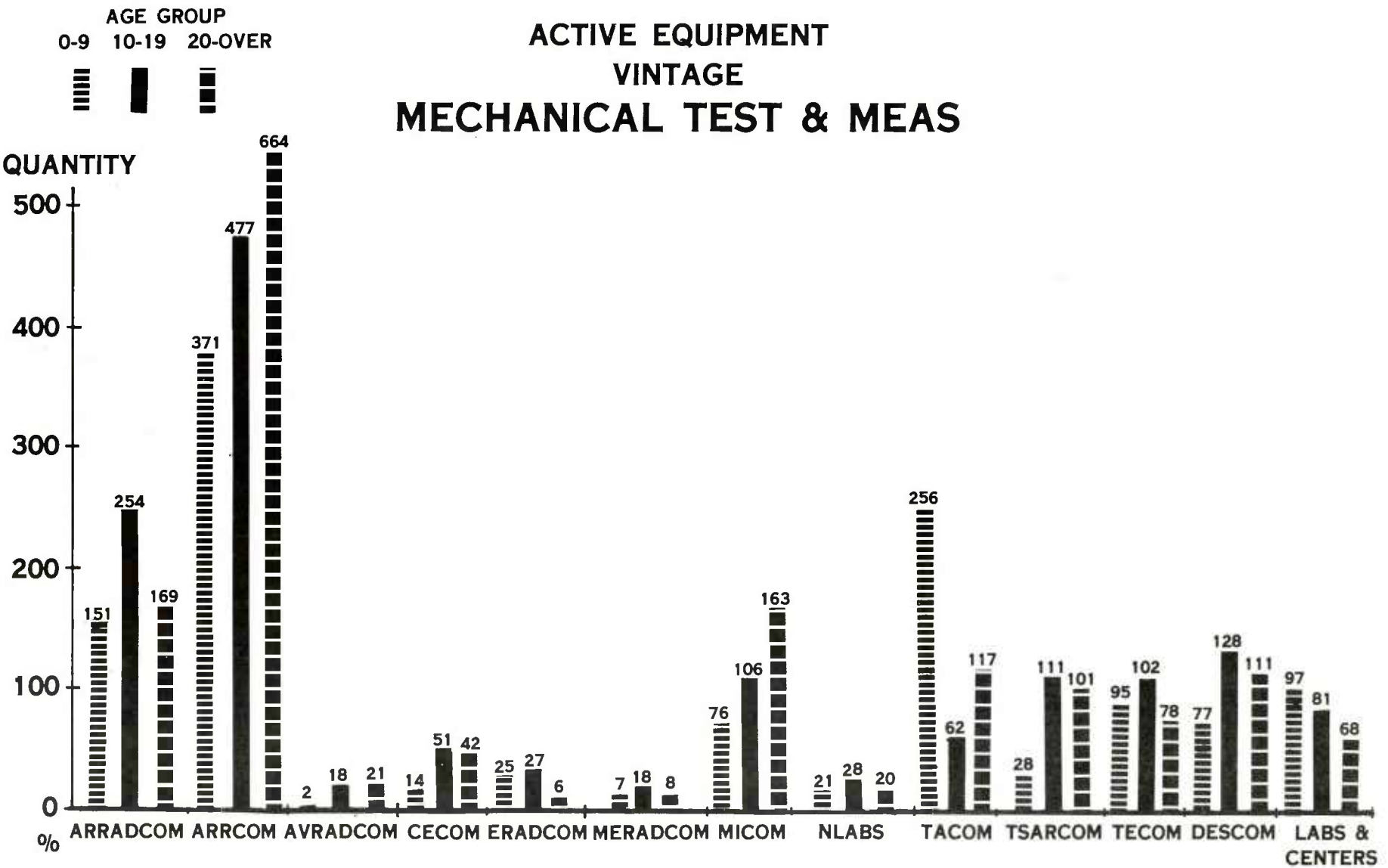
%													
1980													
1985													
0-9YRS	21	26	0	31	40	45	20	35	43	3	17	22	23
10-19	37	30	10	39	52	33	29	53	11	43	37	45	32
20-OVER	42	44	90	30	8	22	51	12	46	54	46	33	45

FIGURE III-4



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	38	45	57	12	48	38	50	48	36	9	35	33	39
10-19	45	44	39	28	28	56	36	40	53	49	33	40	47
20-OVER	17	11	4	60	24	6	14	12	11	42	32	27	14

FIGURE III-5



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
0-9 YRS	26	25	5	13	43	21	22	30	59	12	35	24	39
10-19	44	32	44	48	47	55	31	41	14	46	37	41	33
20-OVER	30	44	51	39	10	24	47	29	27	42	28	35	28

FIGURE III-6

Useful Service Life. The quantity and percent of each of the six classes of equipment that exceed useful service life are shown in the following figures:

Federal Supply Class (FSC)	Figure	Page
METALCUTTING	III-7	3-9
WELDING	III-8	3-10
METALFORMING	III-9	3-11
HEAT TREAT AND FURNACES	III-10	3-12
ELECTRICAL TESTING AND MEASURING	III-11	3-13
MECHANICAL TESTING AND MEASURING	III-12	3-14

The percent of metalcutting equipment that exceeds useful service life varies from 36 percent, or 66 items, being used by ERADCOM to 76 percent, or 1,367 items, controlled by TACOM. However, ARRCOM has the most equipment, 5,763 items or 64 percent, that exceed useful service life.

Welding equipment which exceeds useful service life varies from 14 percent (excluding AVRADCOM), or six items, belonging to ERADCOM to 56 percent, or five items controlled by NLABS. DESCOM and ARRCOM have the most items exceeding useful service life, 214 and 153 items respectively.

AVRADCOM has the highest percent of metalforming equipment which exceeds useful service life with 83 percent, or 40 items. NLABS has the lowest percent with 47 percent, or 8 items. ARRCOM has the greatest quantity, 1,636 items, exceeding useful service life which is 67 percent of their items.

ARRCOM has 370 items classified as heat treating equipment and furnaces that exceed useful service life, more than any other command within DARCOM. ERADCOM and NLABS, with six percent, or three items and one item, have the lowest percent exceeding useful service life. AVRADCOM with 90 percent, or 19 items, has the highest percent exceeding useful service life.

The percent of electrical testing and measuring equipment that exceeds useful service life varies from 25 percent, or 158 items, for MERADCOM to 77 percent, or 1,809 items for CECOM. This class of equipment is widely used within DARCOM. TECOM has the most equipment in this class that exceeds useful service life with 3,176 items, or 48 percent; followed by DESCOM with 1,896 items, or 44 percent; and CECOM with 1,809 items or 77 percent.

The 636 items, or 42 percent, of ARRCOM's mechanical testing and measuring equipment, which exceed useful service life are the most for a command within DARCOM. The percent exceeding useful service life for this class varies from 10 percent, or six items, for ERADCOM to 51 percent, or 21 items, for AVRADCOM.

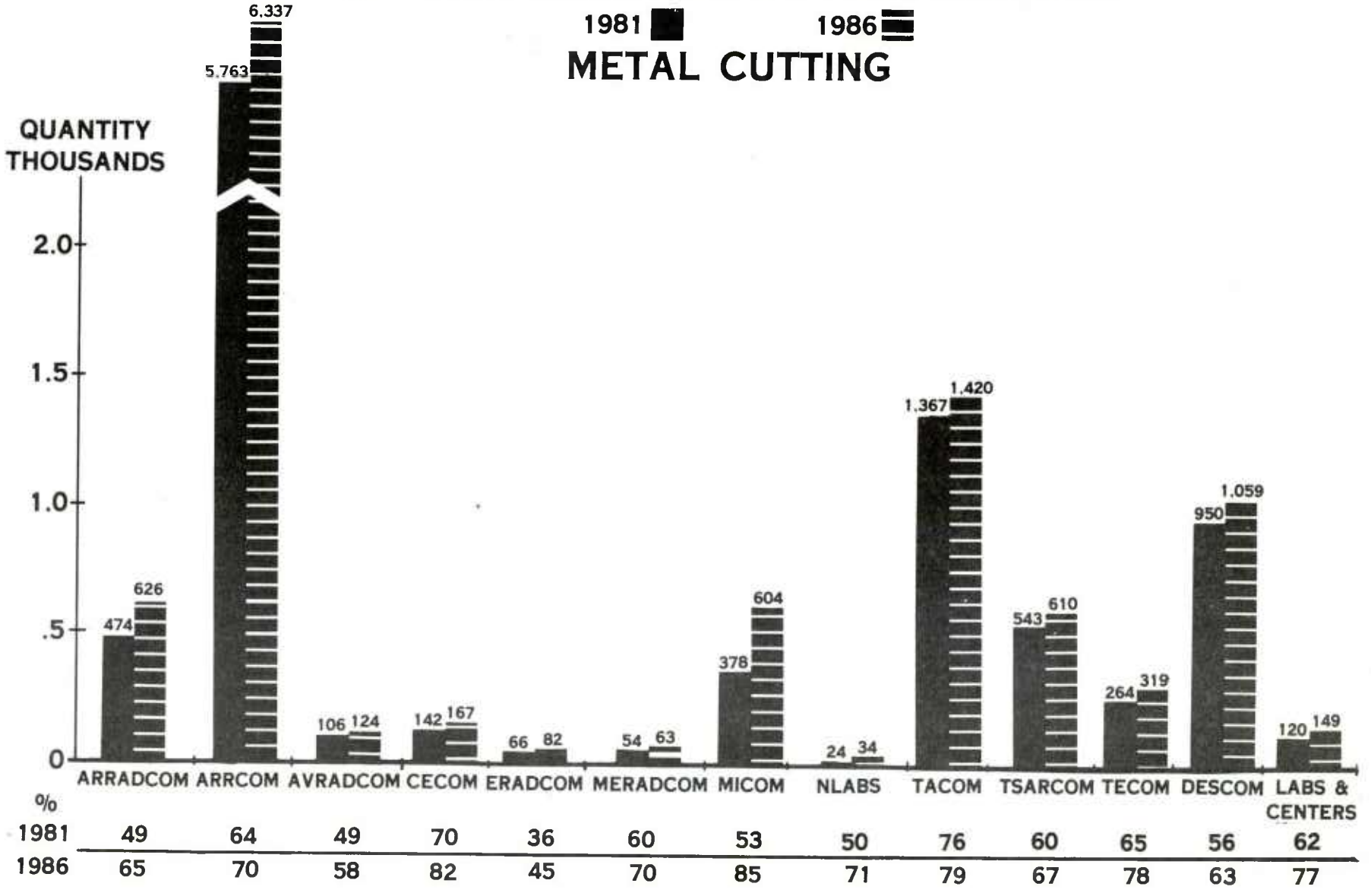

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
1981
1986
METAL CUTTING
QUANTITY THOUSANDS
2.0
1.5
1.0
.5
0
6.337
5.763
626
474
106 124
142 167
66 82
54 63
378 604
24 34
1.367 1.420
543 610
264 319
950 1.059
120 149
ARRADCOM ARRCOM AVRADCOM CECOM ERADCOM MERADCOM MICOM NLABS TACOM TSARCOM TECOM DESCOM LABS & CENTERS
%
1981 49 64 49 70 36 60 53 50 76 60 65 56 62
1986 65 70 58 82 45 70 85 71 79 67 78 63 77

FIGURE III-7

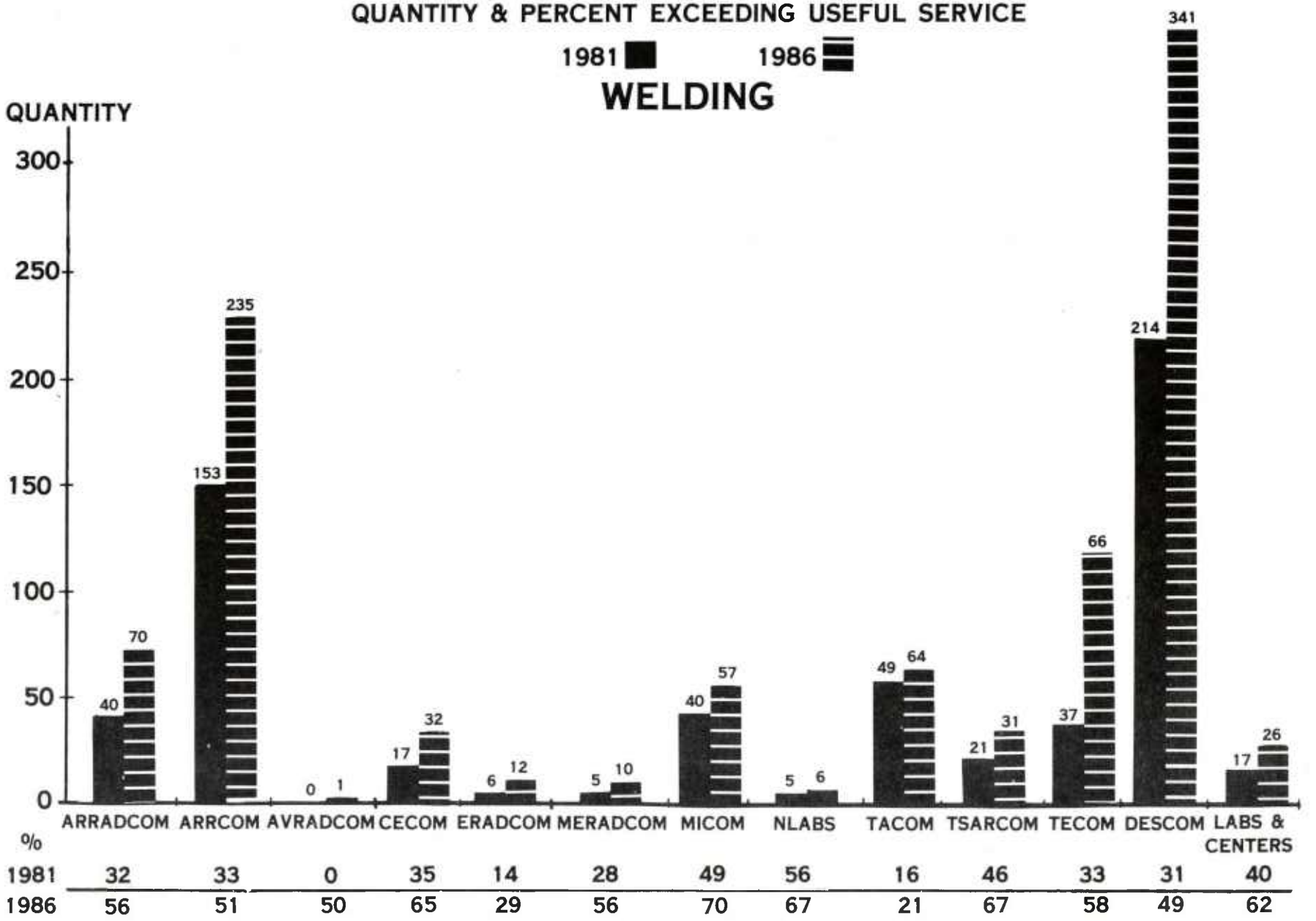

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE
1981
1986
WELDING
QUANTITY
300
250
200
150
100
50
0
40
70
153
235
0
1
17
32
6
12
5
10
40
57
5
6
49
64
21
31
37
66
214
341
17
26
ARRADCOM
ARRCOM
AVRADCOM
CECOM
ERADCOM
MERADCOM
MICOM
NLABS
TACOM
TSARCOM
TECOM
DESCOM
LABS & CENTERS
%
1981 32 33 0 35 14 28 49 56 16 46 33 31 40
1986 56 51 50 65 29 56 70 67 21 67 58 49 62

FIGURE III-8

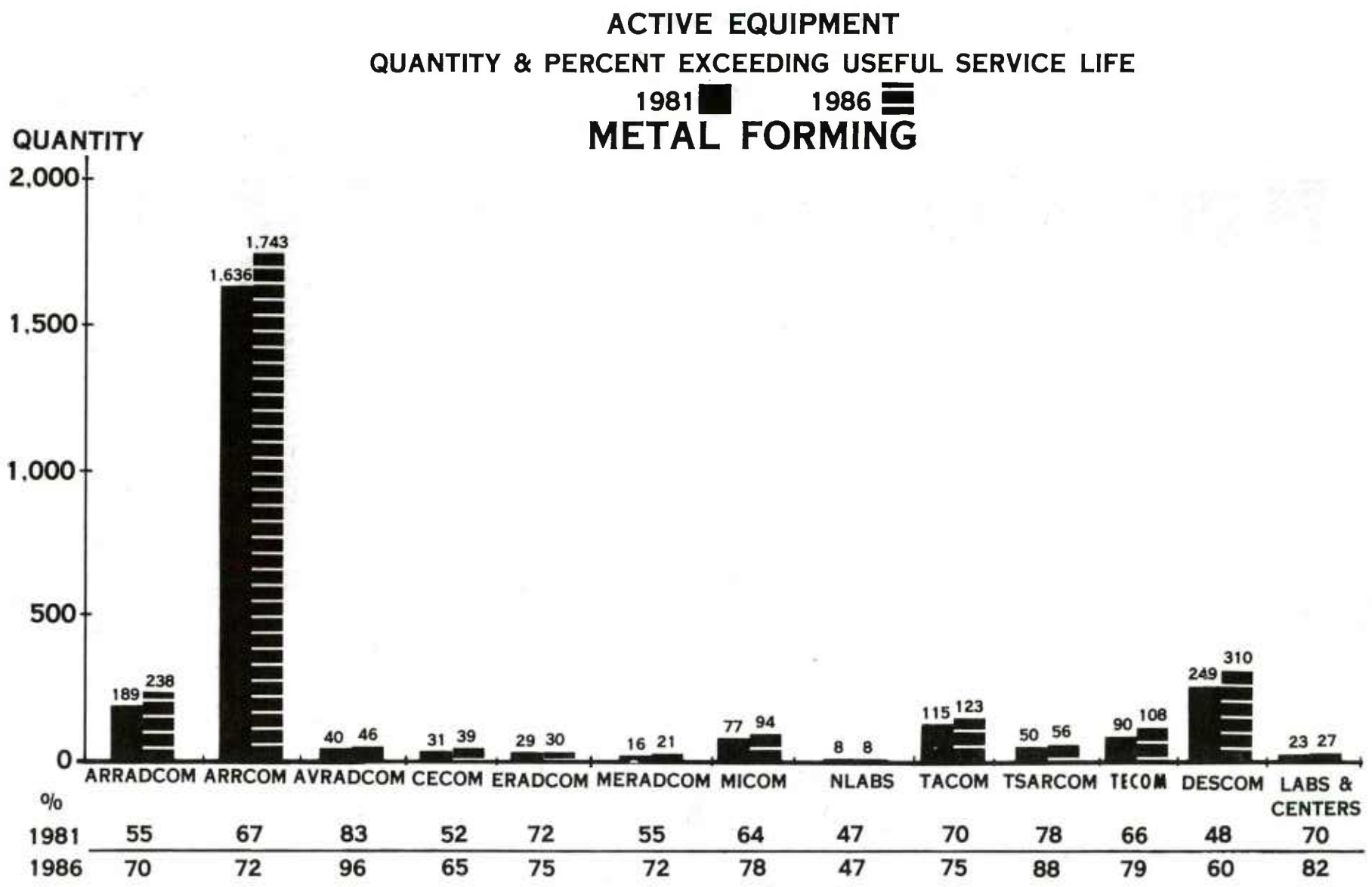

ACTIVE EQUIPMENT
QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE
1981
1986
METAL FORMING
QUANTITY
2,000
1,500
1,000
500
0
189 238
1,636 1,743
40 46
31 39
29 30
16 21
77 94
8 8
115 123
50 56
90 108
249 310
23 27
ARRADCOM ARRCOM AVRADCOM CECOM ERADCOM MERADCOM MICOM NLABS TACOM TSARCOM TECOM DESCOM LABS & CENTERS
%
1981 55 67 83 52 72 55 64 47 70 78 66 48 70
1986 70 72 96 65 75 72 78 47 75 88 79 60 82

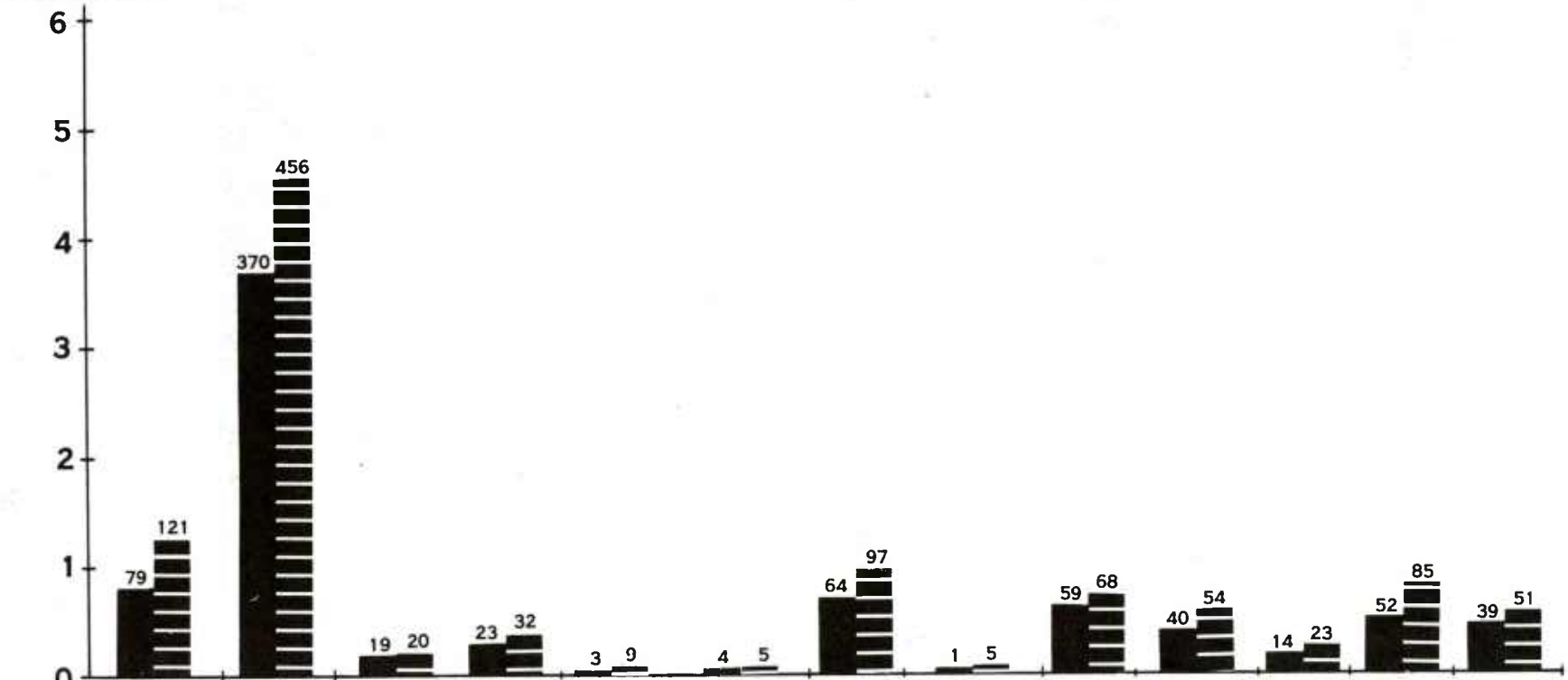
FIGURE III-9

ACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

1981 ■ 1986 ▤

HEAT TREAT & FURNACES



%	ARADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
1981	33	40	90	27	6	22	40	6	43	53	40	27	36
1986	51	50	95	37	19	28	61	29	50	71	66	44	51

FIGURE III-10

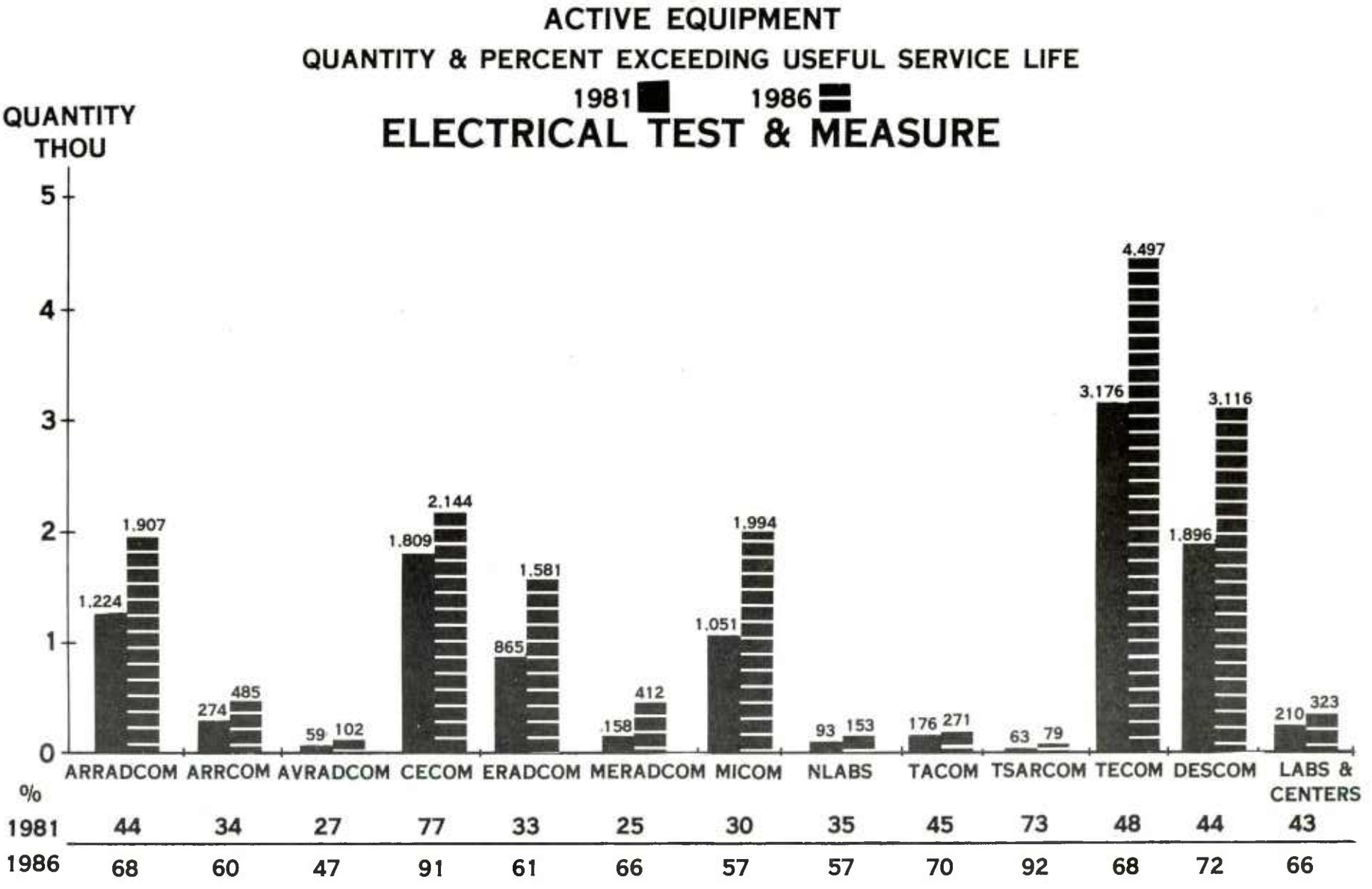


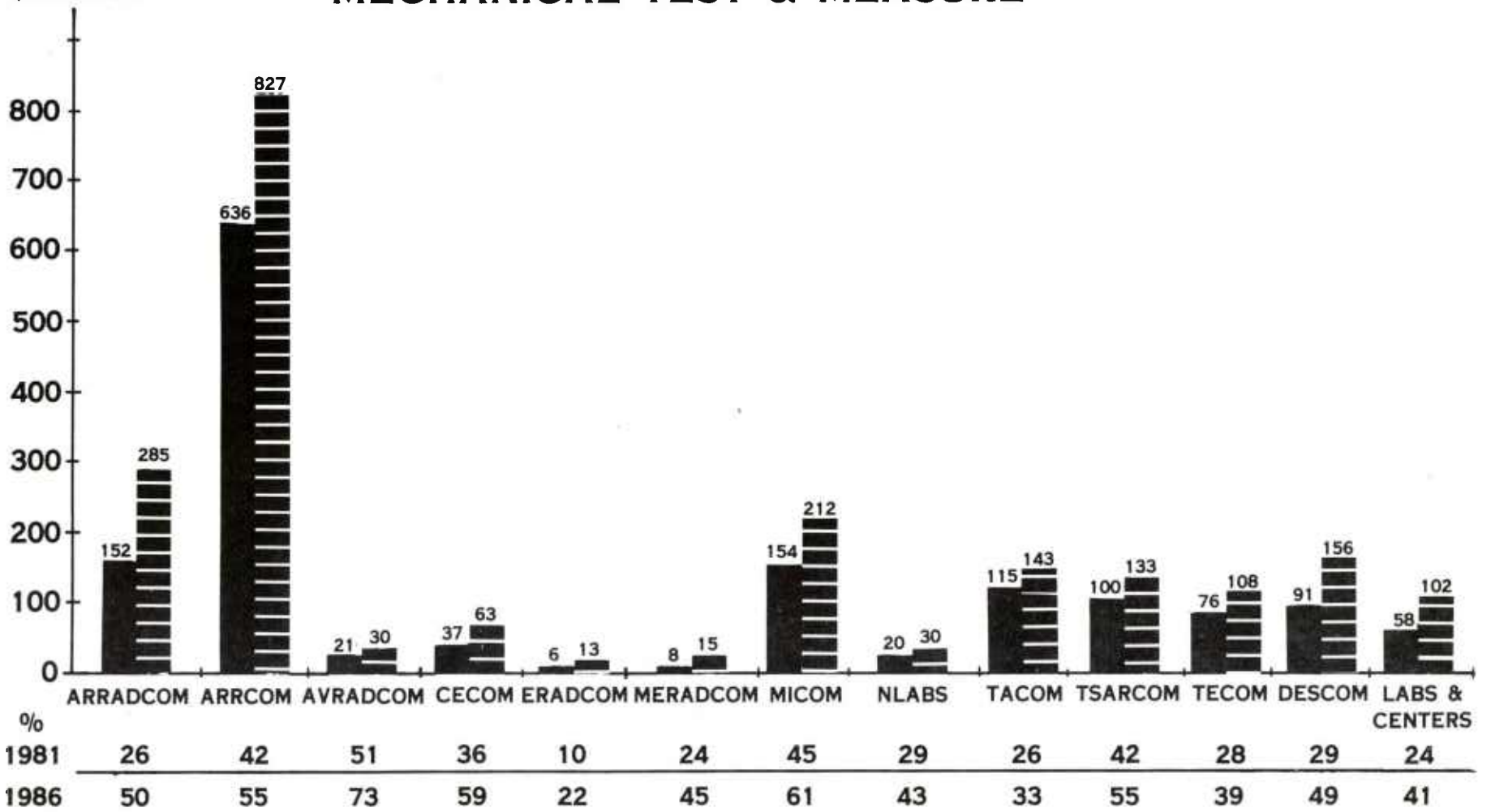
FIGURE III-11

ACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

1981 ■ 1986 ▬

MECHANICAL TEST & MEASURE



%	ARRADCOM	ARRCOM	AVRADCOM	CECOM	ERADCOM	MERADCOM	MICOM	NLABS	TACOM	TSARCOM	TECOM	DESCOM	LABS & CENTERS
1981	26	42	51	36	10	24	45	29	26	42	28	29	24
1986	50	55	73	59	22	45	61	43	33	55	39	49	41

FIGURE III-12

INACTIVE EQUIPMENT

Age Distribution (Vintage). The age distribution for each of the six classes of equipment is shown in the following figures:

Federal Supply Class (FSC)	Figure	Page
METALCUTTING	III-13	3-16
WELDING	III-14	3-17
METALFORMING	III-15	3-18
HEAT TREAT AND FURNACES	III-16	3-19
ELECTRICAL TESTING AND MEASURING	III-17	3-20
MECHANICAL TESTING AND MEASURING	III-18	3-21

As might be expected, the inactive equipment being retained by DARCOM in plant equipment packages (PEP's) has a much older age profile than active equipment.

The bulk of the metalcutting equipment is over 20 years old, varying from zero percent for AVRADCOM to 100 percent for CECOM. However, ARRCOM controls much more of this equipment with TACOM a distant second. Significantly, 88 percent of ARRCOM's 9,335 items and 99 percent of TACOM's 1,967 items are over 20 years old.

Only two commands have welding equipment in storage. ARRCOM has the most equipment, 197 items. TACOM is second with 156 items. Fifty-one percent of ARRCOM's items and 36 percent of TACOM's items are over 20 years old.

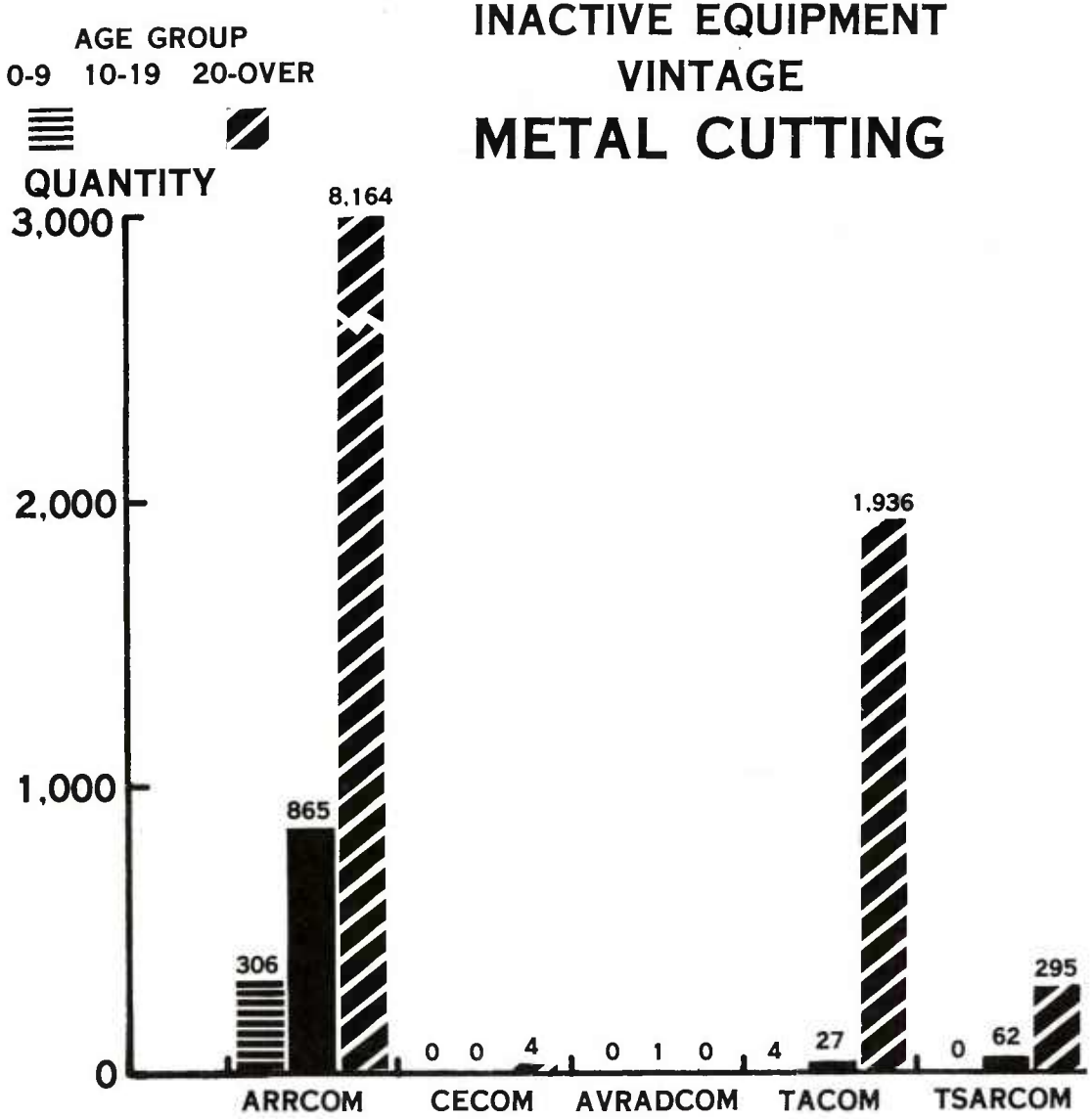
Metalforming equipment is predominantly over 20 years old. Eighty-seven percent of ARRCOM's items and 100 percent of TACOM's and TSARCOM's, items are over 20 years old. ARRCOM controls the bulk of this inactive equipment, 3,273 items, followed by TACOM with 31 items.

ARRCOM has by far the most heat treating equipment and furnaces, 646 items, or 71 percent over 20 years old. However, 95 percent of TACOM's 73 items are over 20 years old.

ARRCOM and CECOM are the only commands that have electrical testing and measuring equipment in storage. Most of ARRCOM's items are more than 10 years old. All of CECOM's 14 items are more than 10 years old.

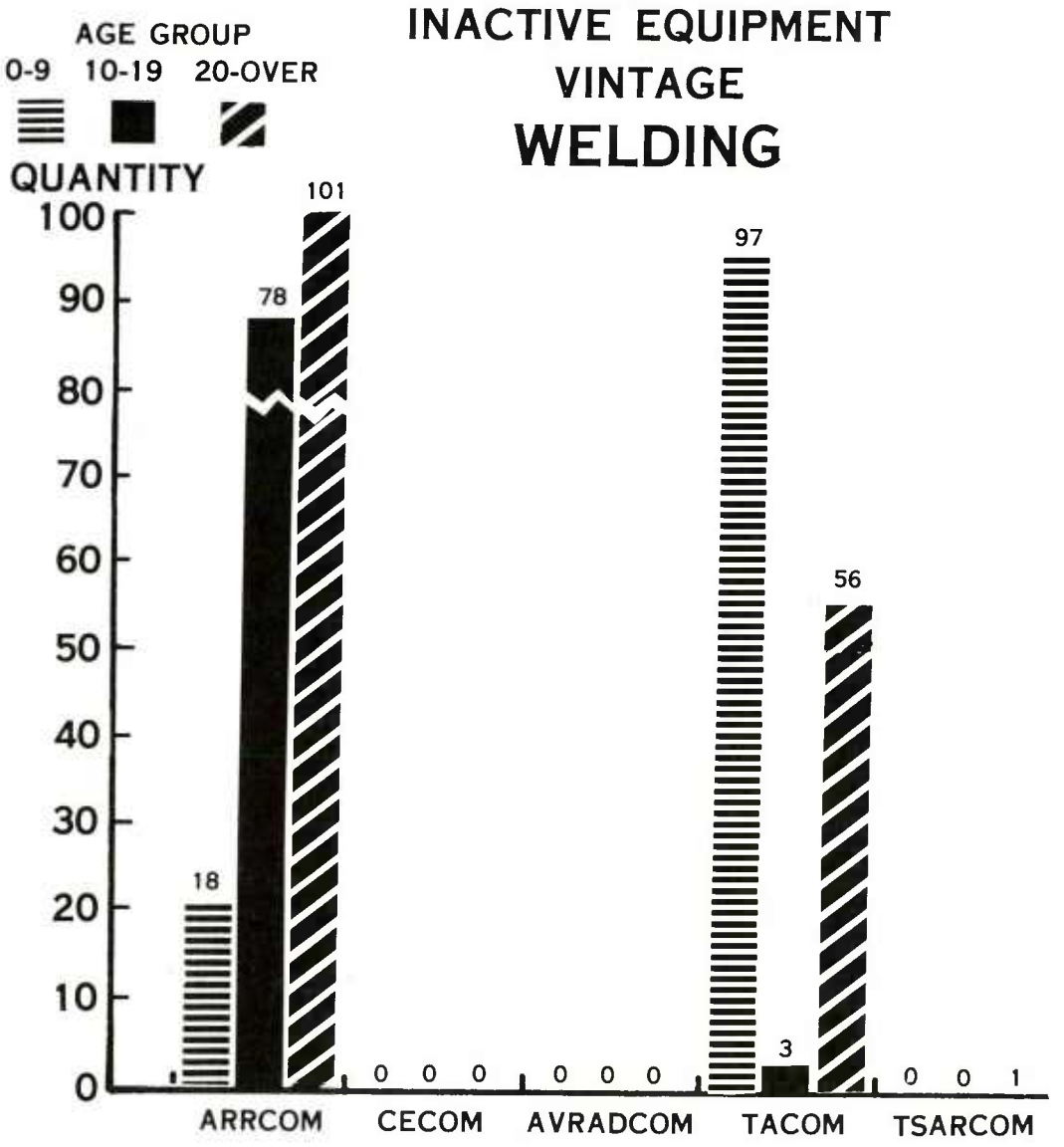
ARRCOM has the bulk of the mechanical testing and measuring equipment that is being retained. Fifty percent of that equipment, or 331 items, is over 20 years old. Ninety-nine percent, or 149 items, of TACOM's equipment is over 20 years old.

INACTIVE EQUIPMENT
VINTAGE
METAL CUTTING



PERCENT	ARRCOM	CECOM	AVRADCOM	TACOM	TSARCOM
0-9 YRS	3	0	0	0	0
10-19	9	0	100	1	17
20-OVER	88	100	0	99	83

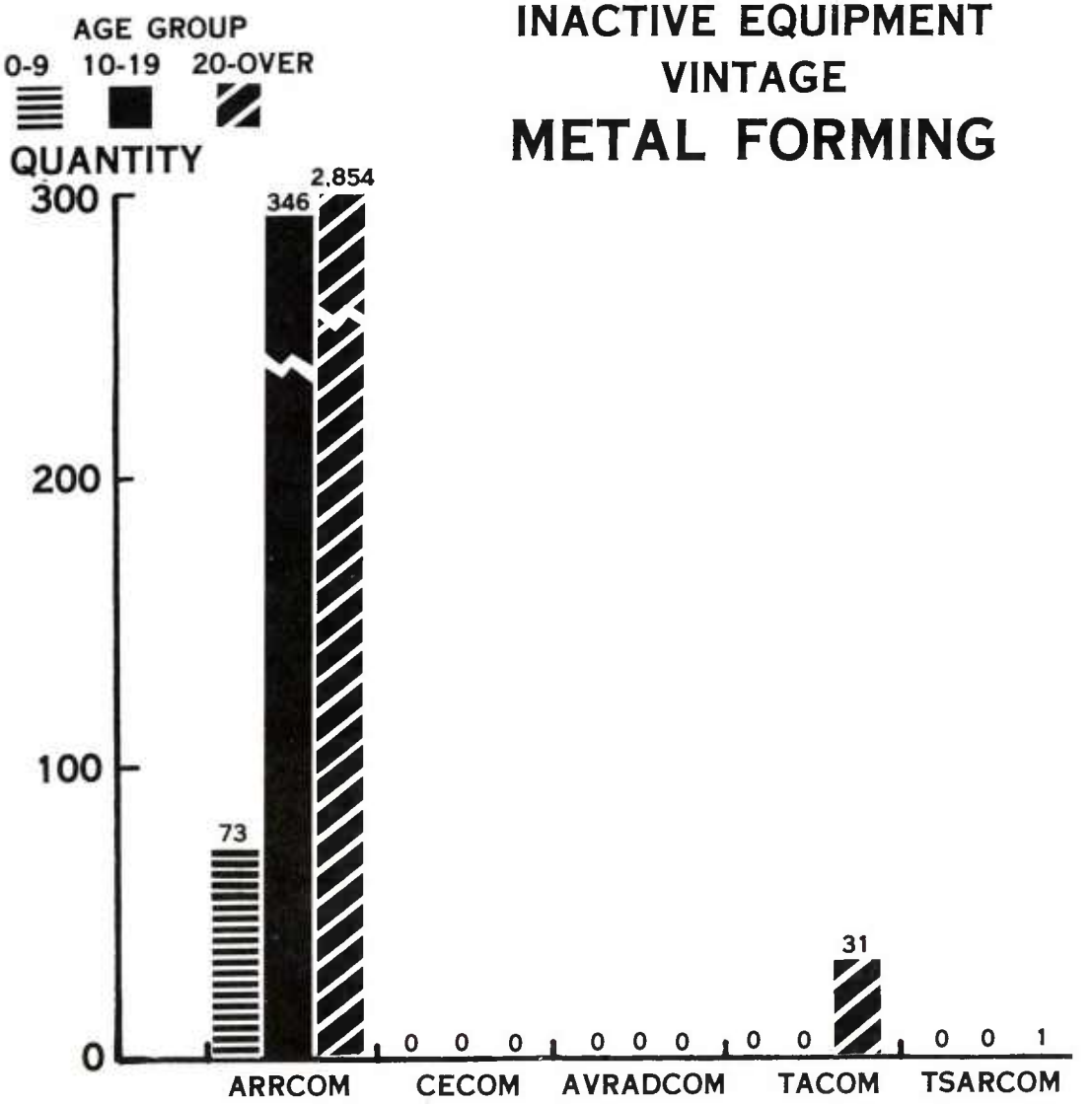
FIGURE III-13



PERCENT					
0-9 YRS	9	0	0	62	0
10-19	40	0	0	2	0
20-OVER	51	0	0	36	100

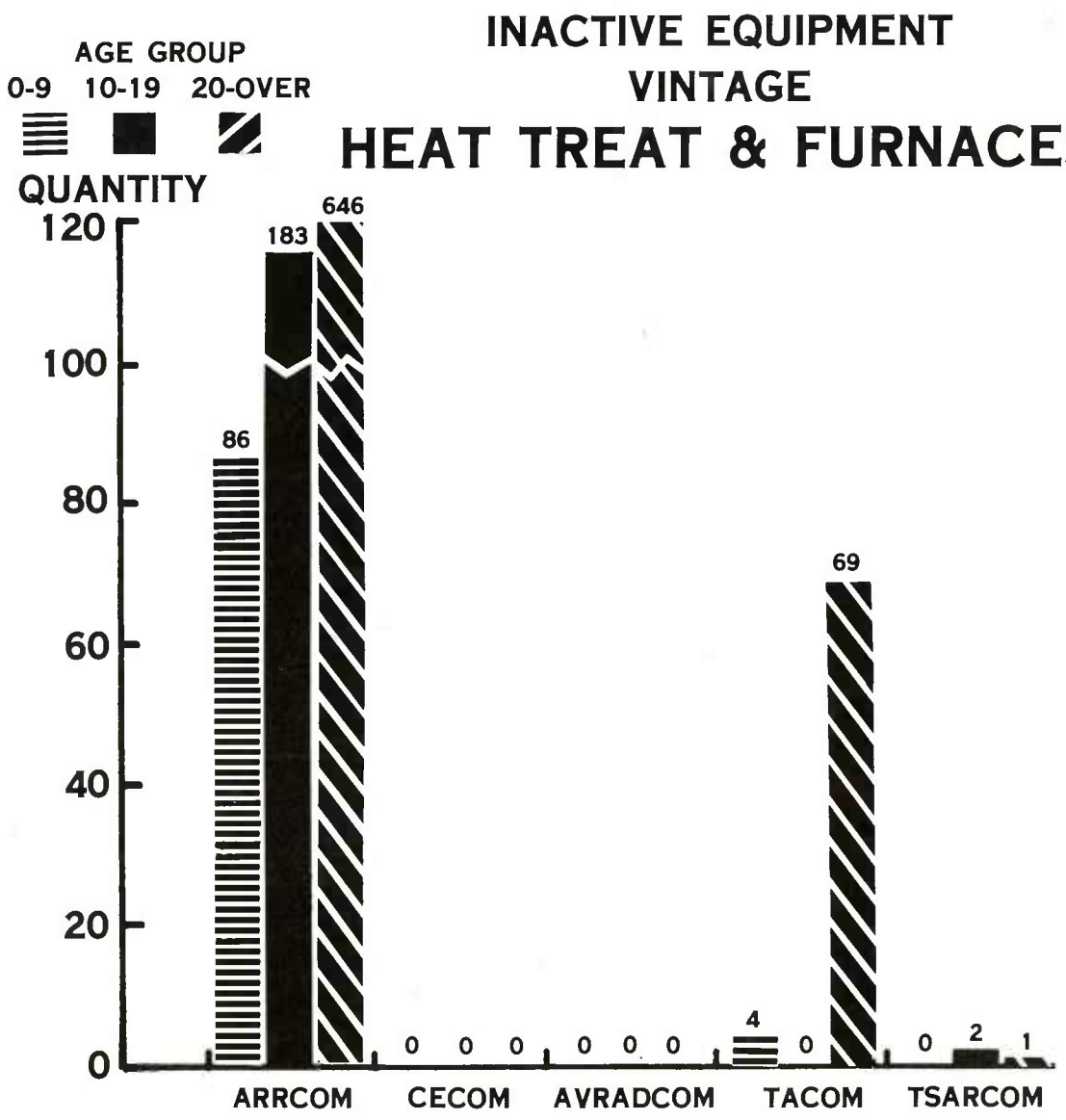
FIGURE III-14

INACTIVE EQUIPMENT VINTAGE
METAL FORMING



PERCENT					
0-9 YRS	2	0	0	0	0
10-19	11	0	0	0	0
20-OVER	87	0	0	100	100

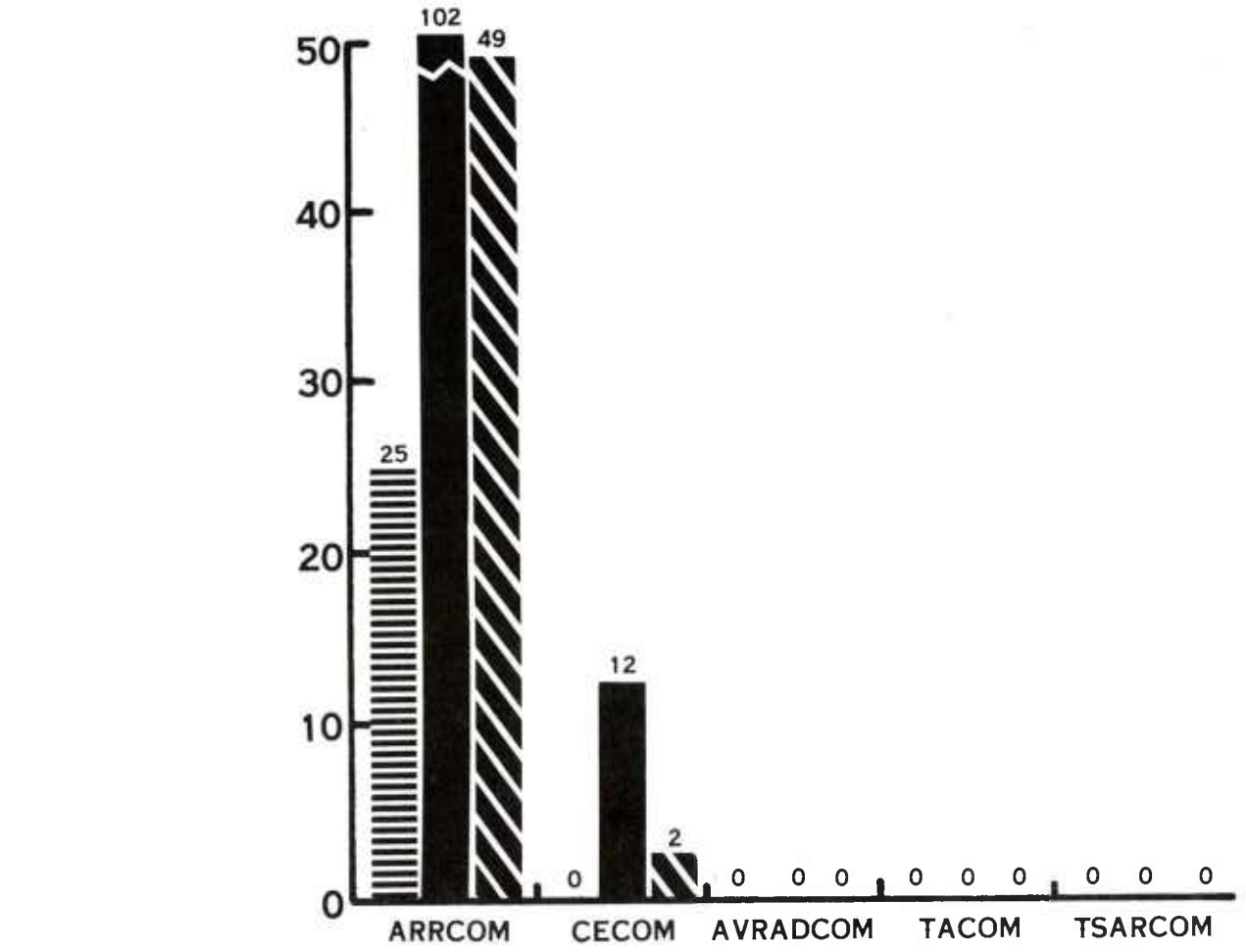
FIGURE III-15



PERCENT					
0-9 YRS	9	0	0	5	0
10-19	20	0	0	0	67
20-OVER	71	0	0	95	33

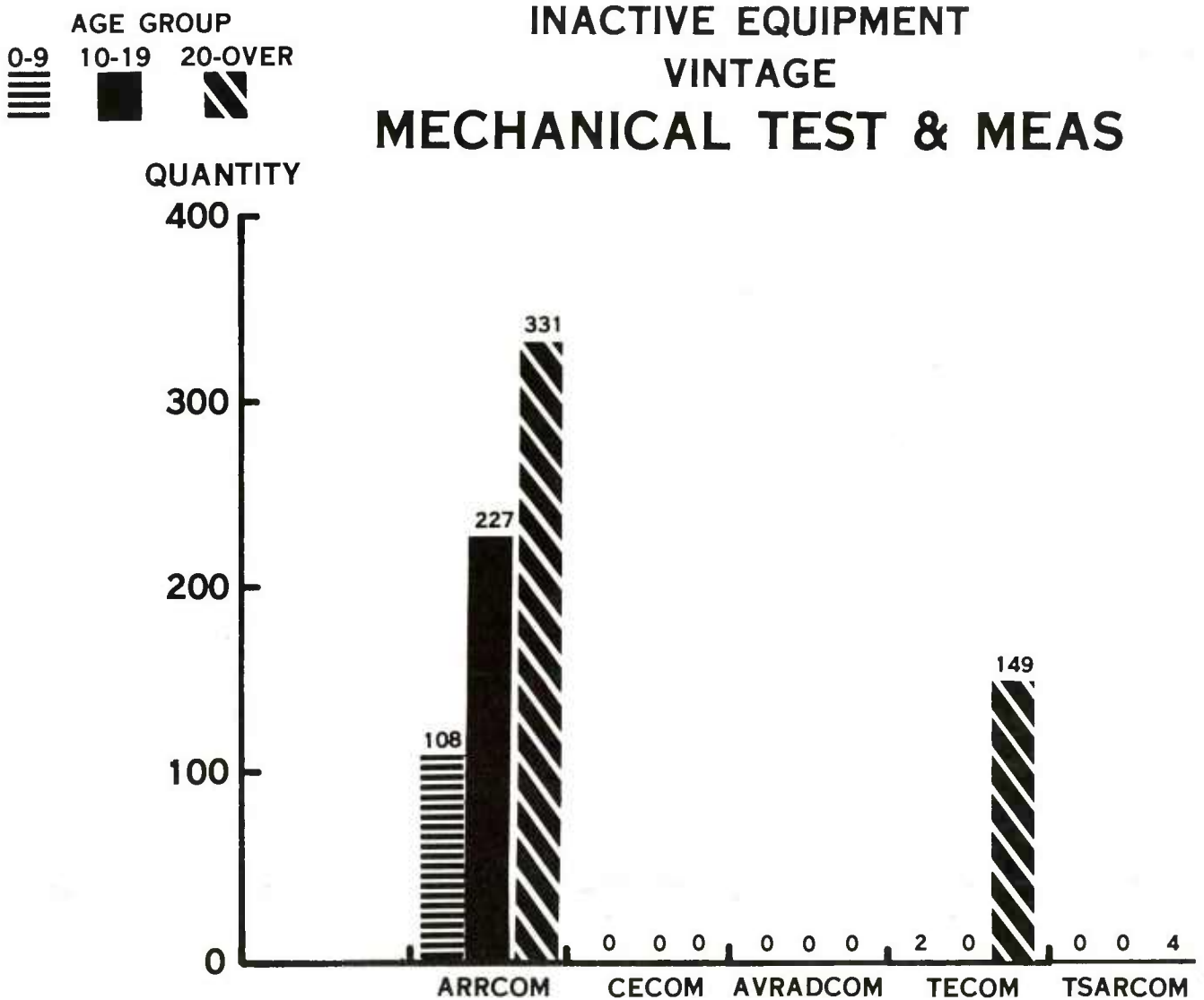
FIGURE III-16

INACTIVE EQUIPMENT VINTAGE
ELECTRICAL TEST & MEAS



PERCENT					
0-9 YRS	14	0	0	0	0
10-19	58	86	0	0	0
20-OVER	28	14	0	0	0

FIGURE III-17



PERCENT					
0-9 YRS	16	0	0	1	0
10-19	34	0	0	0	0
20-OVER	50	0	0	99	100

FIGURE III-18

Useful Service Life. The quantity and percent of each of the six classes of equipment that exceed useful service life are shown in the following figures:

Federal Supply Class (FSC)	Figure	Page
METALCUTTING	III-19	3-23
WELDING	III-20	3-24
METALFORMING	III-21	3-25
HEAT TREAT AND FURNACES	III-22	3-26
ELECTRICAL TESTING AND MEASURING	III-23	3-27
MECHANICAL TESTING AND MEASURING	III-24	3-28

Useful service life is primarily dependent on use which is not directly related to the age of inactive equipment. Therefore, a comparison of equipment age to useful service life for inactive equipment is of limited value.

ARRCOM and TACOM have almost all of the inactive equipment that exceeds useful service life.

A greater percentage of the equipment controlled by TACOM exceeds useful service life than that being retained by ARRCOM. However, ARRCOM has five times as much inactive equipment that exceeds its useful service life. The other SUBMACOM's have only small amounts of equipment that exceed useful service life compared to ARRCOM and TACOM.

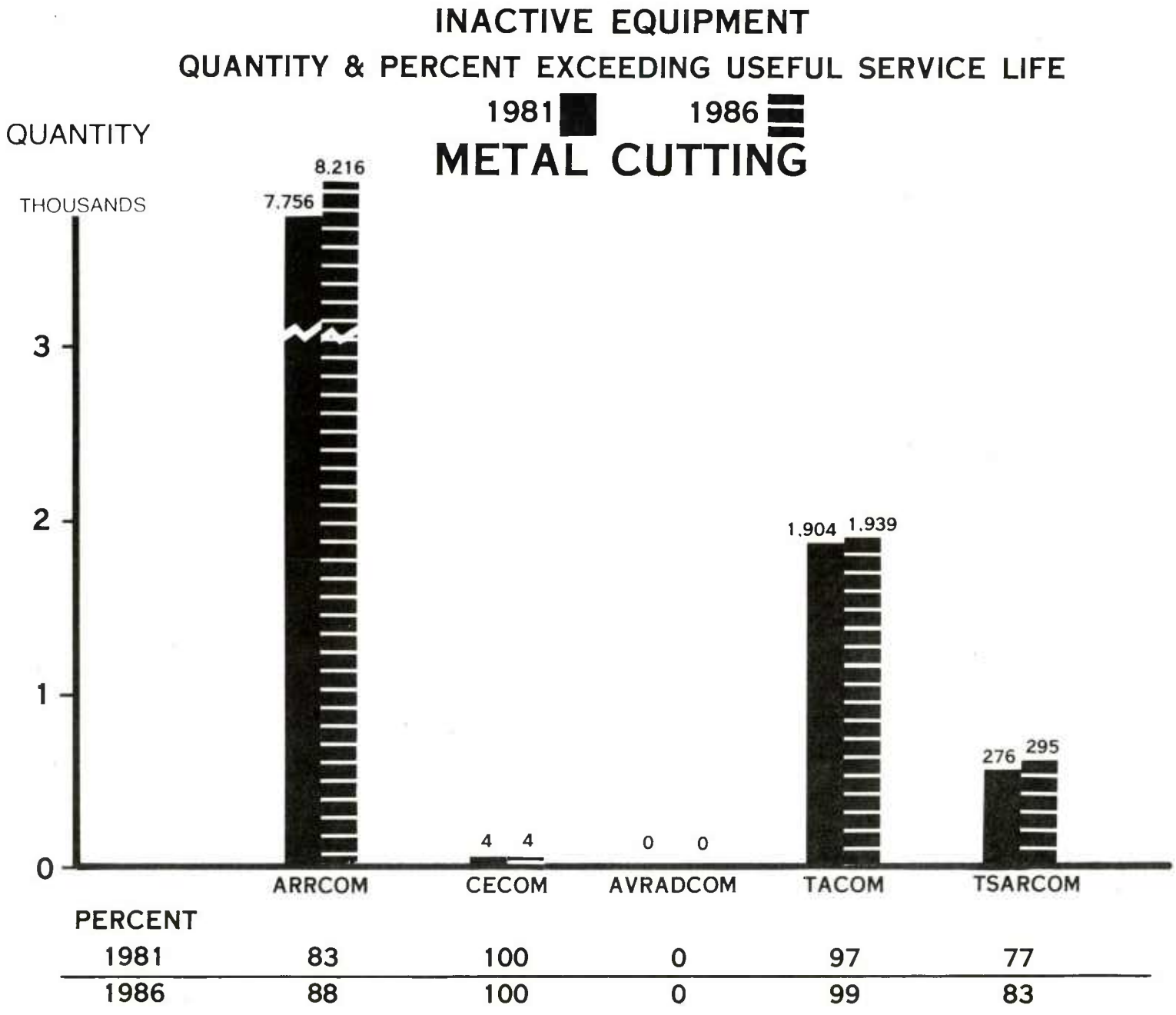
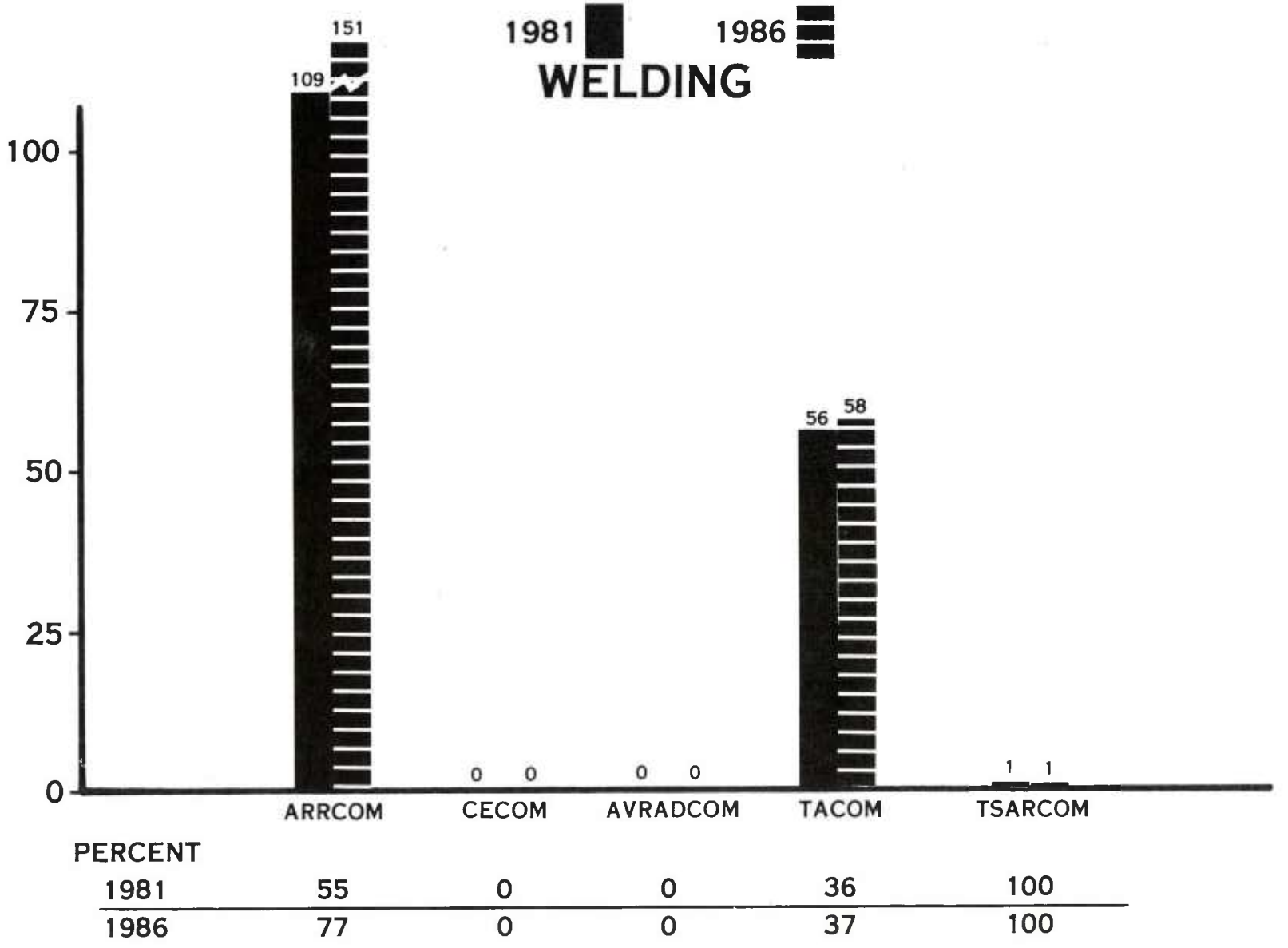


FIGURE III-19



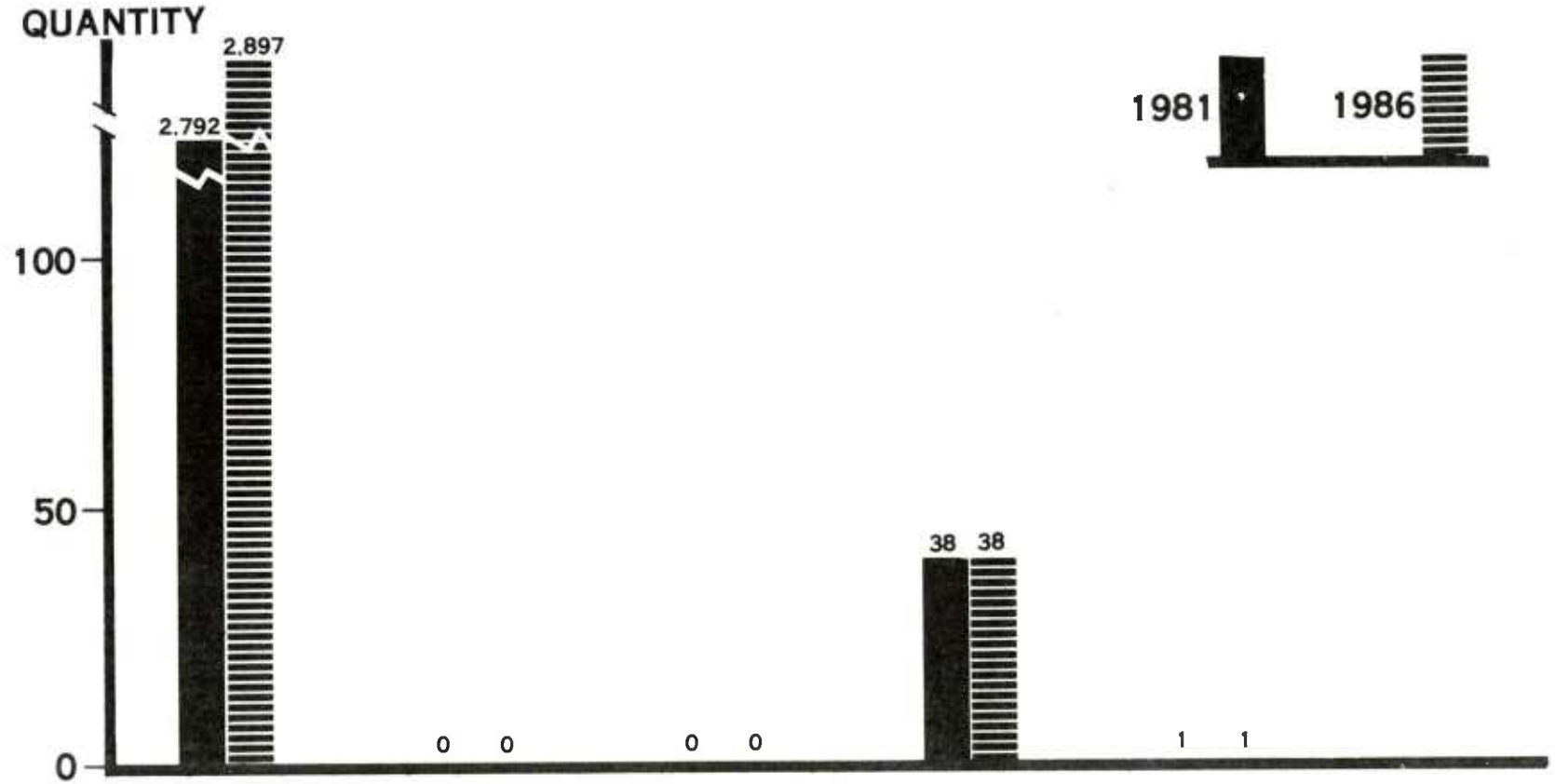
PERCENT					
1981	55	0	0	36	100
1986	77	0	0	37	100

FIGURE III-20

INACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

METAL FORMING



PERCENT

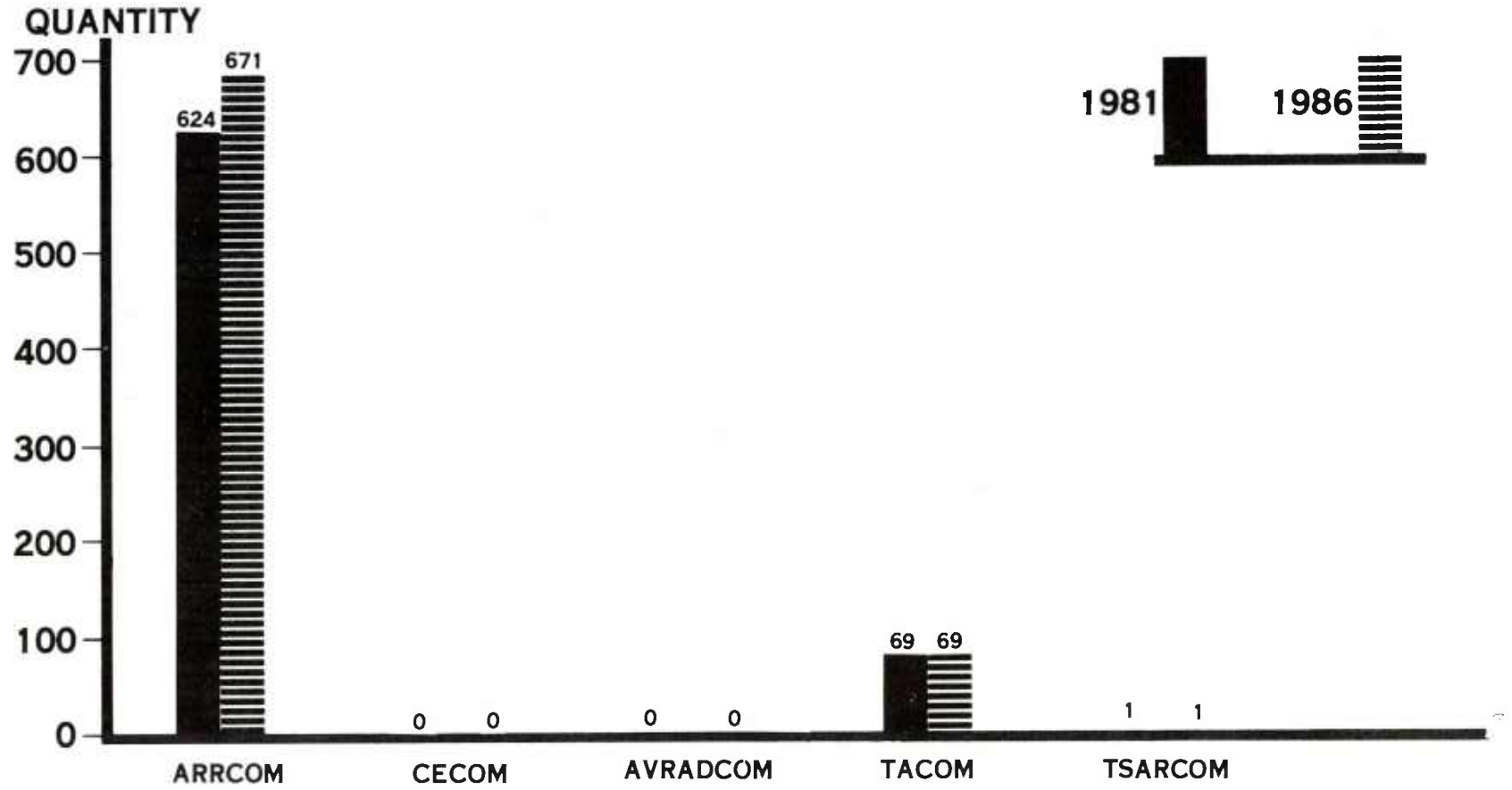
	ARRCOM	CECOM	AVRADCOM	TACOM	TSARCOM
1981	85	0	0	100	100
1986	89	0	0	100	100

FIGURE III-21

INACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

HEAT TREAT & FURNACES



PERCENT					
1981	68	0	0	95	33
1986	73	0	0	95	33

FIGURE III-22

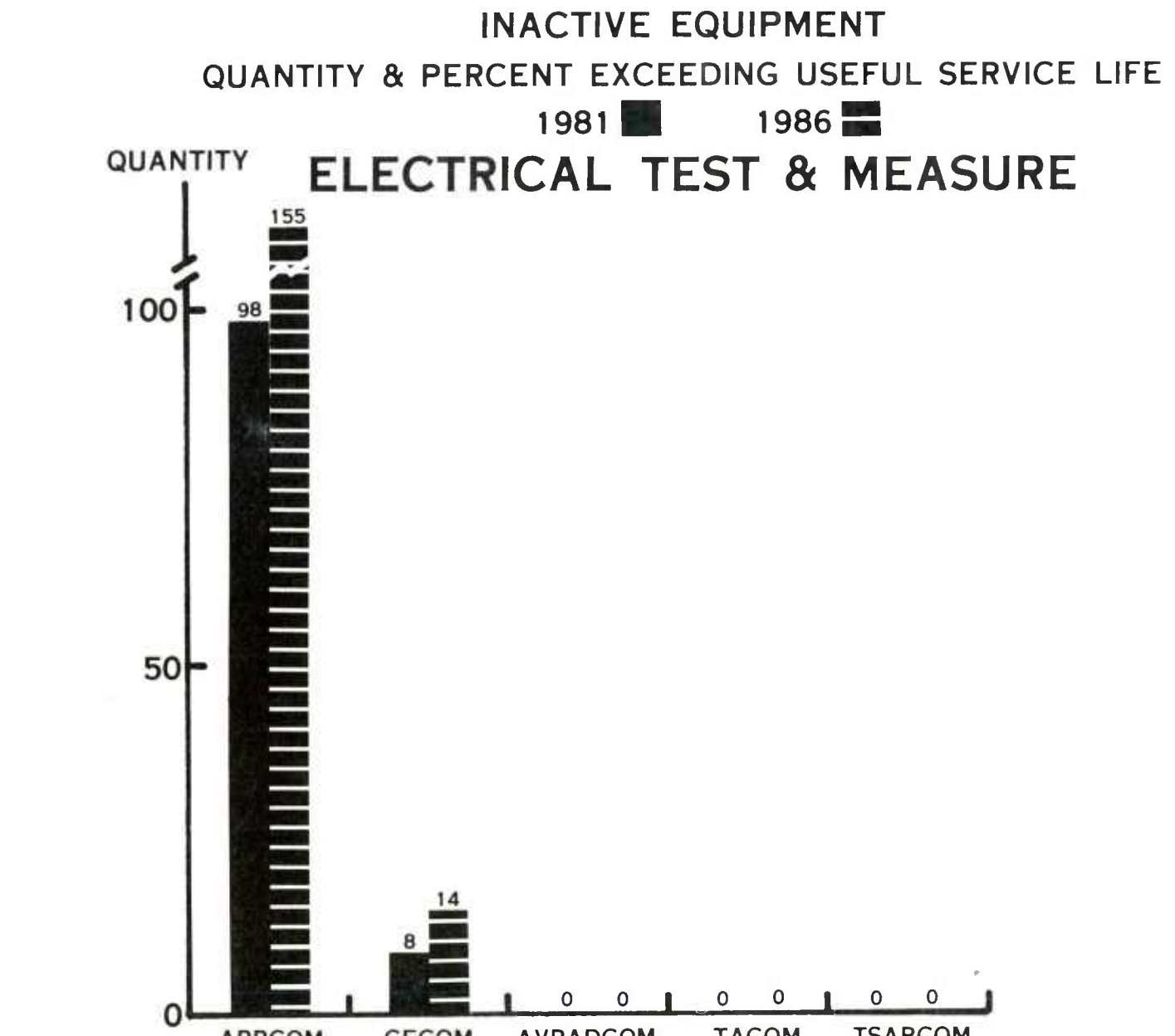


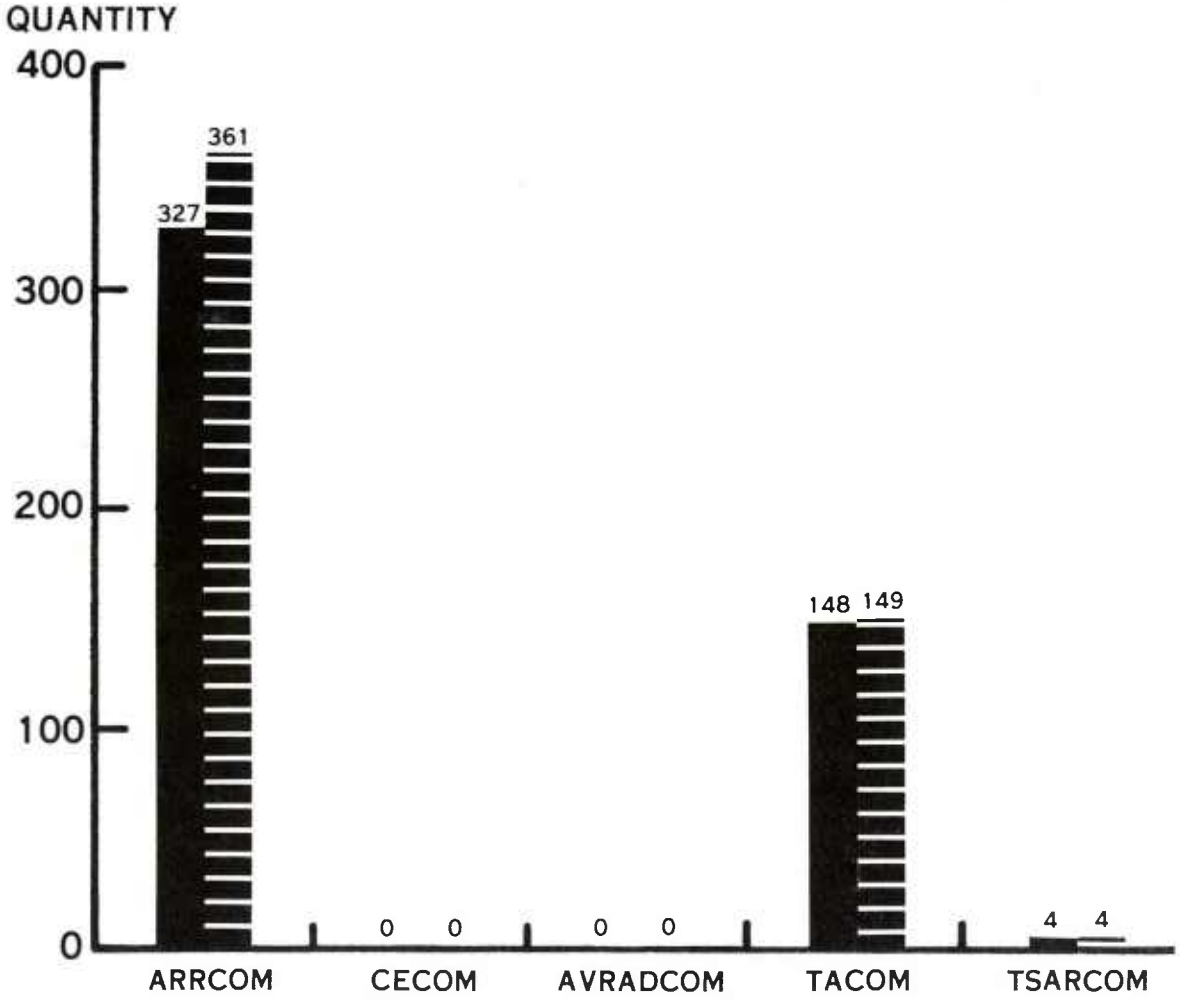
FIGURE III-23

INACTIVE EQUIPMENT

QUANTITY & PERCENT EXCEEDING USEFUL SERVICE LIFE

1981 1986

MECHANICAL TEST & MEASURE



PERCENT					
1981	49	0	0	98	100
1986	54	0	0	99	100

FIGURE III-24

SECTION IV

NUMERICAL CONTROL (NC)

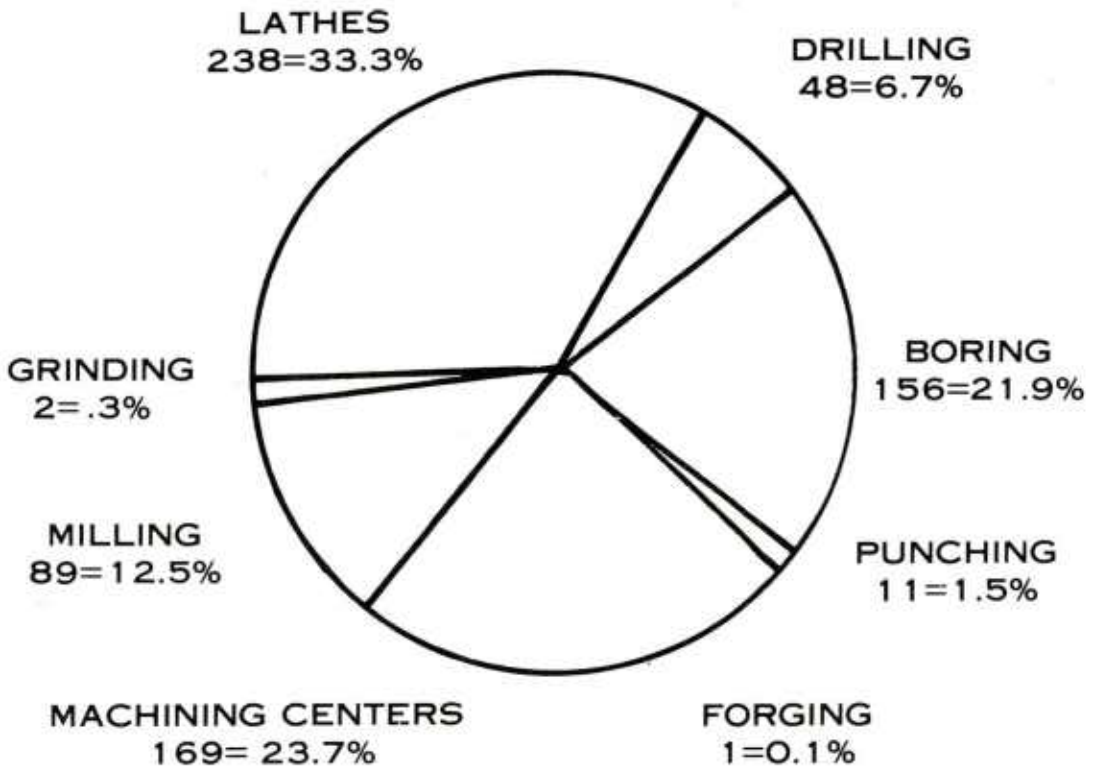
Numerical control (NC) is available in eight classes of metalworking equipment owned by the Army. These classes are: boring, drilling, lathes, milling, machining centers, punching, grinding, and forging. The Army inventory of this equipment is shown in Figure IV-1. Boring machines, lathes, and machining centers make up 79 percent of the inventory, or 563 items. Punching, grinding, and forging machines represent only two percent of the inventory, or 14 items.

Numerically controlled machines make a significant contribution to the production capacity of the industrial base and represent a sizeable investment. The Army numerical control inventory consists of 714 items with an acquisition cost of $157,078,939. All but one of these items are controlled by DARCOM. The distribution of the NC inventory is shown in Figure IV-2. Government-owned, Government-operated (GOGO) facilities are using 26.5 percent, or 189, of the items and have an additional 7.4 percent, or 53 items, declared idle, i.e., subject to intermittent use, but required to remain in place in support of the current assigned mission. Government-owned, Contractor-operated (GOCO) facilities have 18.6 percent, or 133 items, and 28.9 percent, or 206 items, is provided to contractor-owned, contractor-operated facilities as Government furnished equipment, (GFE). The remaining 18.6 percent, or 133 items, is assigned to plant equipment packages (PEP's) for possible use in mobilization production.

The trend of the inventory of numerical controlled equipment is shown in Figure IV-3. An increasing trend characterizes the inventory, especially since 1978. The disproportionate increase in acquisition cost shown in 1978 is attributable to the addition of the rotary forge at Watervliet Arsenal at a cost of $6,749,185. The average cost of numerical control equipment has continued to increase at a rapid rate to $210,546.

The source of the data for numerical control equipment is the DIPEC SP-50 Report as of 30 Jan 82.

NUMERICAL CONTROL INVENTORY BY CLASS



	BORING	DRILLING	LATHES	MILLING	MACHINGING CENTERS	PUNCHING	GRINDING	FORGING	TOTAL
ACTIVE	136	35	204	74	161	7	2	1	620
INACTIVE	20	13	34	15	8	4	0	0	94
TOTAL	156	48	238	89	169	11	2	1	714

FIGURE IV-1

NUMERICAL CONTROL INVENTORY QUANTITY AND USE

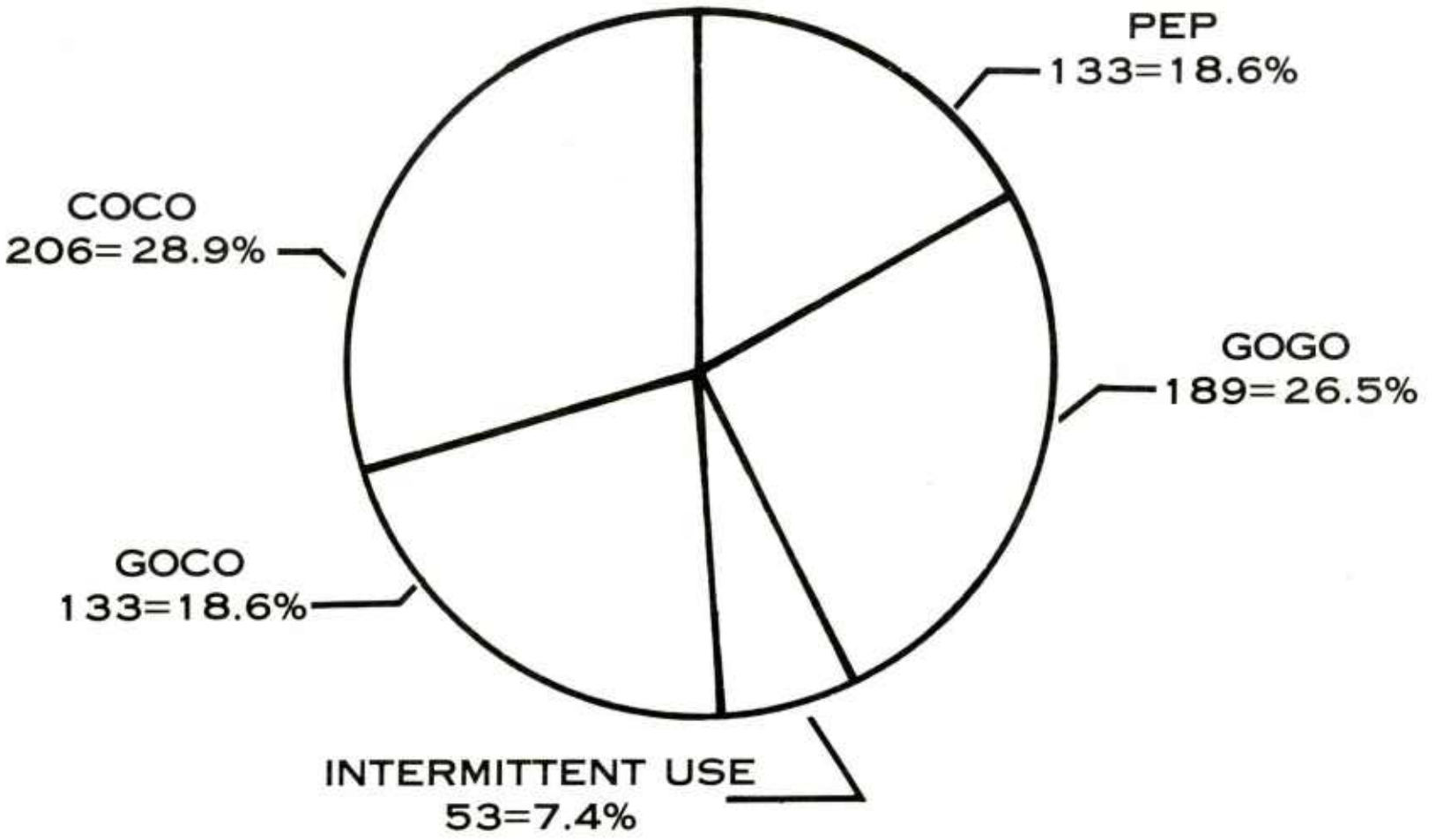
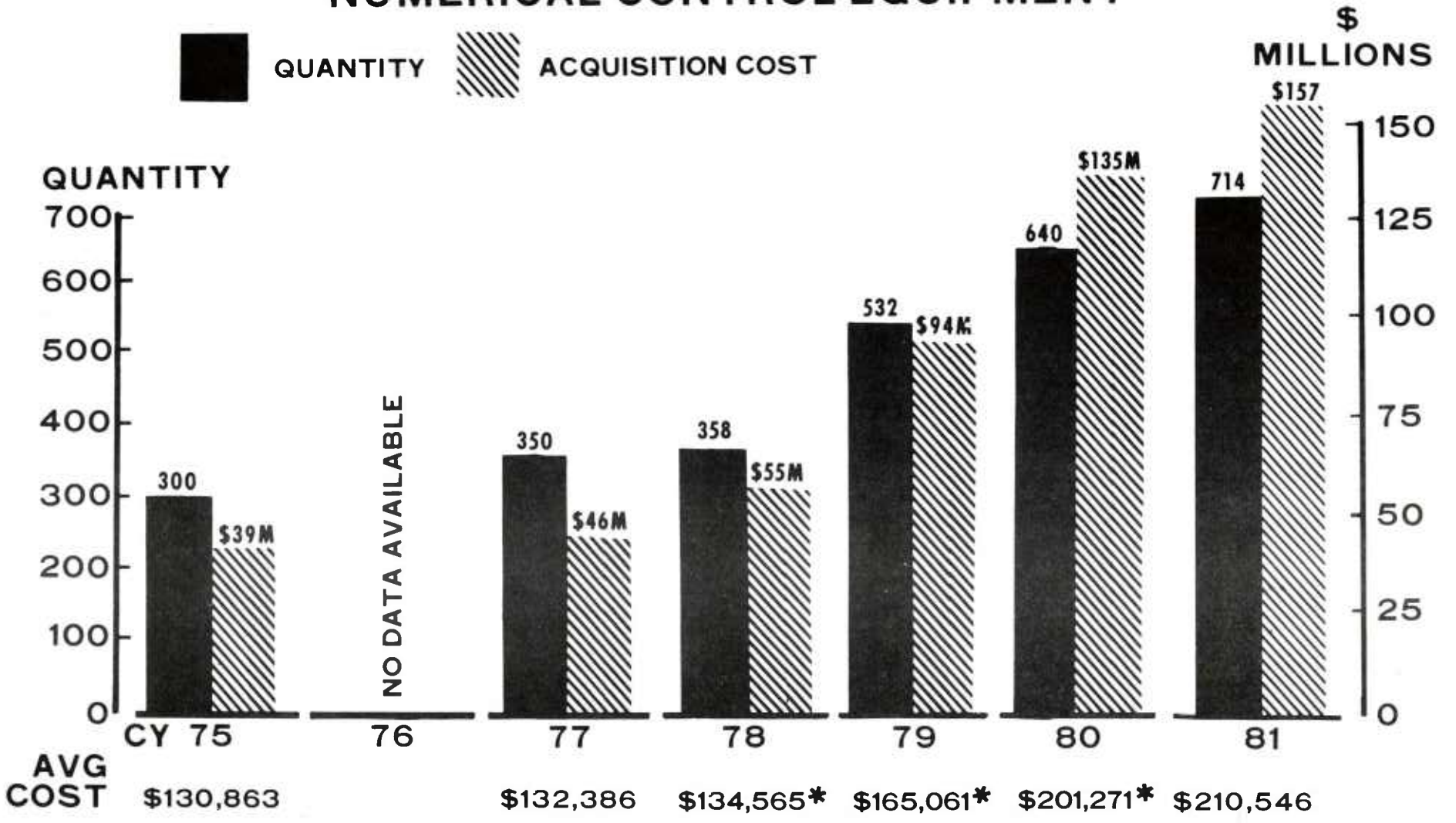


FIGURE IV-2

INVENTORY TRENDS
NUMERICAL CONTROL EQUIPMENT



NOTE: *AVERAGE COST DOES NOT INCLUDE THE ROTARY FORGE AT WATERVLIET ARSENAL WITH A COST OF $6,749,185.

FIGURE IV-3

APPENDIX A

Illustrations of Industrial Plant Equipment (IPE)

with

Federal Supply Classes (FSC)

APPENDIX A

Illustrations of Industrial Plant Equipment (IPE)

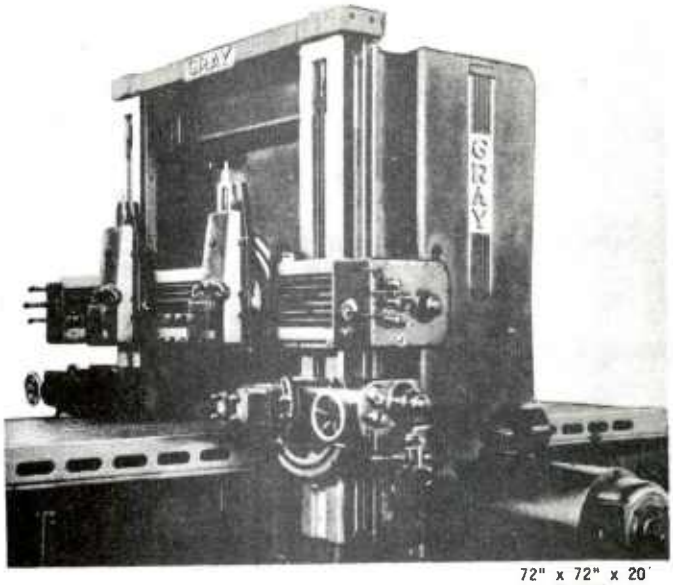
with

Federal Supply Classes (FSC)

METALCUTTING

FSC

3405	Saw and Filing Machines
3408	Machining Centers and Way Type Machines
3410	Electrical and Ultrasonic Erosion Machines
3411	Boring Machines
3412	Broaching Machines
3413	Drilling and Tapping Machines
3414	Gear Cutting and Finishing Machines
3415	Grinding Machines
3416	Lathes
3417	Milling Machines
3418	Planers and Shapers
3419	Miscellaneous Machine Tools



72" x 72" x 20'
PLANER

WELDING

FSC

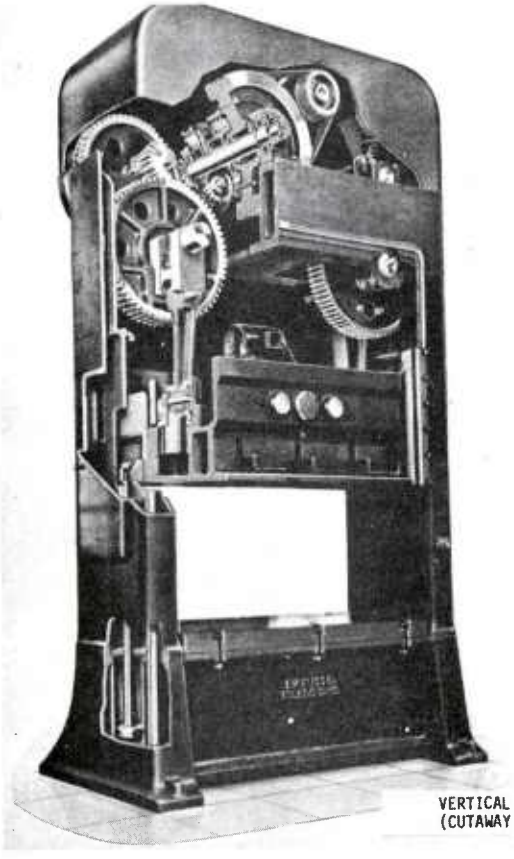
3431	Electric Arc Welding Equipment
3432	Electric Resistance Welding Equipment
3433	Gas Welding, Heat Cutting and Metalizing Equipment
3436	Welding Positioners and Manipulators
3438	Miscellaneous Welding Equipment

ENGINE DRIVEN
ARC WELDER

METAL FORMING

FSC

3422	Rolling Mills and Drawing Machines
3441	Bending and Forming Machines
3442	Hydraulic and Pneumatic Presses, Power Driven
3443	Mechanical Power Presses, Power Driven
3444	Manual Presses
3445	Punching and Shearing Machines
3446	Forging Machinery and Hammers
3447	Wire and Metal Ribbon Forming Machines
3448	Riveting Machines



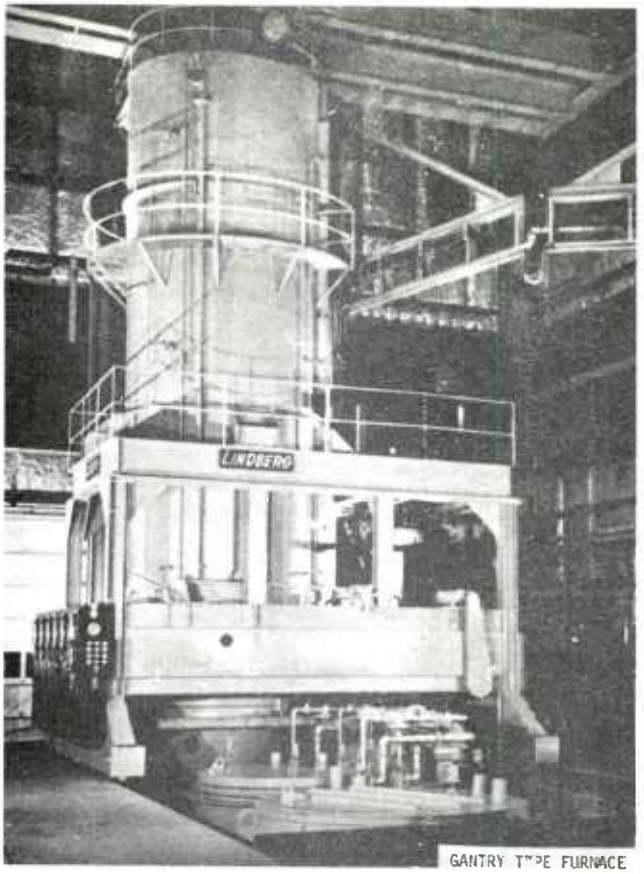
VERTICAL PRESS
(CUTAWAY VIEW)

HEAT TREAT AND FURNACES

FSC

3424 Metal Heat Treating and Nonthermal Treating Equipment

4430 Industrial Furnaces, Kilns, Lehrs, and Ovens



GANTRY TYPE FURNACE

ELECTRICAL TESTING AND MEASURING DEVICES

FSC

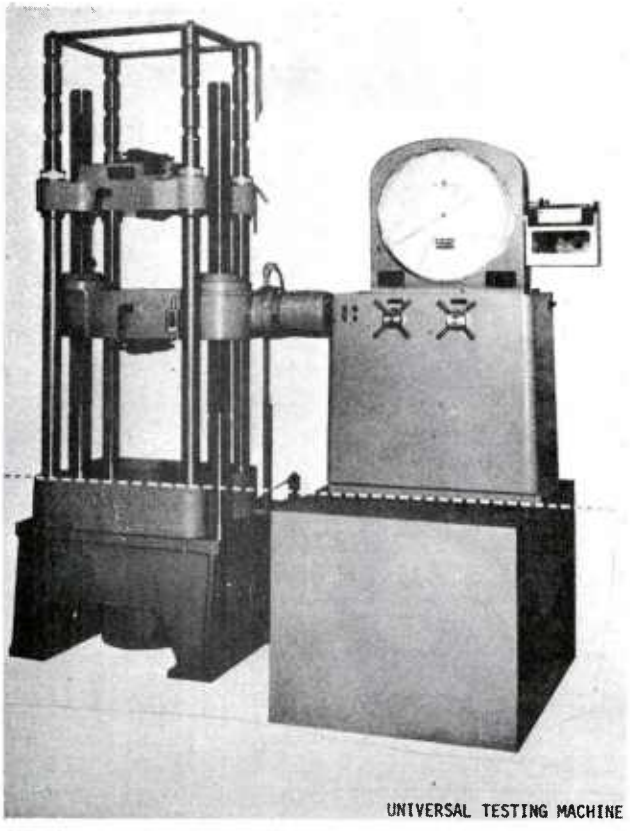
6625 Electrical and Electronic Properties Measuring and Testing Instruments

DIGITAL MULTIMETER (TEST EQUIPMENT)

MECHANICAL TESTING AND MEASURING DEVICES

FSC

6635 Physical Properties Testing Equipment



UNIVERSAL TESTING MACHINE